POWERCUT-1250 / 1500

MANUAL & MECHANIZED PLASMARC CUTTING PACKAGE

Installation, Operation and Service Manual

This manual provides complete instructions for MANUAL CONSOLES starting with Serial Number PxxJ245xxx, May 2003:

This manual provides complete instructions for MECHANIZED CONSOLES starting with Serial Number PxxJ316xxx, May 2003:

0558004285 **04/2009**

BE SURE THIS INFORMATION REACHES THE OPERATOR.
YOU CAN GET EXTRA COPIES THROUGH YOUR SUPPLIER.

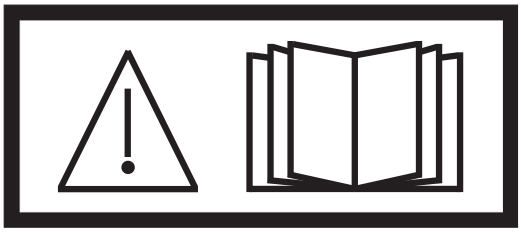
CAUTION

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for arc welding and cutting equipment, we urge you to read our booklet, "Precautions and Safe Practices for Arc Welding, Cutting, and Gouging," Form 52-529. Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information. Be sure to read the Safety Precautions before installing or operating this equipment.

USER RESPONSIBILITY

This equipment will perform in conformity with the description thereof contained in this manual and accompanying labels and/or inserts when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Malfunctioning or poorly maintained equipment should not be used. Parts that are broken, missing, worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, the manufacturer recommends that a telephone or written request for service advice be made to the Authorized Distributor from whom it was purchased.

This equipment or any of its parts should not be altered without the prior written approval of the manufacturer. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, damage, improper repair or alteration by anyone other than the manufacturer or a service facility designated by the manufacturer.



READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

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Safety Precautions

Users of ESAB welding and plasma cutting equipment have the ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions. Safety precautions must meet the requirements that apply to this type of welding or plasma cutting equipment. The following recommendations should be observed in addition to the standard regulations that apply to the workplace.

All work must be carried out by trained personnel well acquainted with the operation of the welding or plasma cutting equipment. Incorrect operation of the equipment may lead to hazardous situations which can result in injury to the operator and damage to the equipment.

1. Anyone who uses welding or plasma cutting equipment must be familiar with:
   - its operation
   - location of emergency stops
   - its function
   - relevant safety precautions
   - welding and / or plasma cutting

2. The operator must ensure that:
   - no unauthorized person stationed within the working area of the equipment when it is started up.
   - no one is unprotected when the arc is struck.

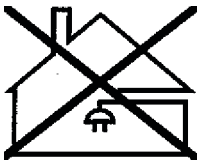
3. The workplace must:
   - be suitable for the purpose
   - be free from drafts

4. Personal safety equipment:
   - Always wear recommended personal safety equipment, such as safety glasses, flame proof clothing, safety gloves.
   - Do not wear loose fitting items, such as scarves, bracelets, rings, etc., which could become trapped or cause burns.

5. General precautions:
   - Make sure the return cable is connected securely.
   - Work on high voltage equipment **may only be carried out by a qualified electrician**.
   - Appropriate fire extinquishing equipment must be clearly marked and close at hand.
   - Lubrication and maintenance **must not** be carried out on the equipment during operation.

CAUTION

Class A (400V CE) equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility of Class A equipment in those locations due to conducted as well as radiated disturbances.



WARNING

WELDING AND PLASMA CUTTING CAN BE INJURIOUS TO YOURSELF AND OTHERS. TAKE PRECAUTIONS WHEN WELDING OR CUTTING. ASK FOR YOUR EMPLOYER'S SAFETY PRACTICES WHICH SHOULD BE BASED ON MANUFACTURERS' HAZARD DATA.

ELECTRIC SHOCK - Can kill.
- Install and earth (ground) the welding or plasma cutting unit in accordance with applicable standards.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from earth and the workpiece.
- Ensure your working stance is safe.

FUMES AND GASES - Can be dangerous to health.
- Keep your head out of the fumes.
- Use ventilation, extraction at the arc, or both, to take fumes and gases away from your breathing zone and the general area.

ARC RAYS - Can injure eyes and burn skin.
- Protect your eyes and body. Use the correct welding / plasma cutting screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

FIRE HAZARD
- Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.

NOISE - Excessive noise can damage hearing.
- Protect your ears. Use earmuffs or other hearing protection.
- Warn bystanders of the risk.

MALFUNCTION - Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

Precauciones de seguridad

Los usuarios de los equipos de corte y soldadura ESAB tienen la responsabilidad de asegurar que las personas que trabajan o están cerca del equipo sigan las normas de seguridad.

Las precauciones de seguridad deben estar de acuerdo con equipos de corte y soldadura. Las recomendaciones abajo deben ser seguidas adicionalmente a las normas estándar.

1. Cualquier persona que utilice un equipo de soldadura o corte plasma debe ser familiar con:
   -su operación
   -localización de los paros de emergencia
   -sus funciones
   -precauciones de seguridad
   -corte plasma y soldadura

2. El operador debe asegurar que:
   -ninguna otra persona este en la área de trabajo durante el arranque de la maquina
   -ninguna persona este sin protección al momento de la partida del arco

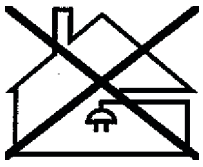
3. La área de trabajo debe:
   -estar de acuerdo con el trabajo
   -estar libre de corrientes de aire

4. Equipo de seguridad individual:
   -siempre utilice equipos de seguridad, lentes, prendas ignífugas, guantes, etc.
   -no utilice artículos sueltos, como bufandas, pulseras, anillos, etc.

5. Precauciones generales:
   -este seguro que el cable de retorno esta bien conectado
   -el trabajo con alta voltaje debe ser realizado por un técnico calificado.
   -un extintor de incendios apropiado debe estar acerca de la maquina.
   -lubricación de la maquina no debe ser realizada durante la operación.

ADVERTENCIA

El equipo de clase A (400 V CE) no está diseñado para su uso en ubicaciones residenciales donde la corriente eléctrica se suministra mediante el sistema de suministro público de baja tensión. Pueden surgir posibles problemas a la hora de garantizar la compatibilidad electromagnética con el equipo de clase A en dichas ubicaciones, debido a las perturbaciones tanto conducidas como radioeléctricas.



ADVERTENCIA **Soldadura y corte plasma puede ser fatal a usted o otros. Tome las precauciones de seguridad para corte plasma y soldadura.**

DESCARGA ELÉCTRICA puede matar.
- **Instale un cable tierra de acuerdo con las normas**
- **No toque partes eléctricas o consumibles que estén energizados.**
- **Mantengas aislado del piso y de la pieza de trabajo.**
- **Certifique que su situación de trabajo es segura**

HUMOS Y GASES- Son peligrosos a su salud
- **Mantenga su cabeza alejada de los humos**
- **utilice ventilación o aspiración para eliminar los humos del área de trabajo.**

RAYO DEL ARCO. Puede quemar la piel o dañar los ojos.
- **Protege sus ojos y piel con lentes y ropa apropiadas.**
- **Proteja las personas en la área de trabajo utilizando una cortina**

PELIGRO DE INCENDIO
- **Chispas pueden provocar incendio. Este seguro que no hagan materiales inflamables al rededor de la maquina.**

RUIDO – El ruido en exceso puede dañar los oídos.
- **Proteja sus oídos. utilice protección auricular.**
- **Avise las personas al rededor sobre el riesgo.**

AVERÍAS – Llame a ESAB en caso de una avería con el equipo.

LEER Y ENTENDER EL MANUAL ANTES DE INSTALAR U OPERAR EL EQUIPO.
PROTEJA A USTED Y LOS OTROS!

Précautions de sécurité

Les utilisateurs du matériel de soudage et de coupage plasma ESAB ont la responsabilité ultime d'assurer que toute personne qui opère ou qui se trouve dans l'aire de travail observe les précautions de sécurité pertinentes. Les précautions de sécurité doivent répondre aux exigences applicables à ce type de matériel de soudage ou de coupage plasma. Les recommandations suivantes doivent être observées en plus des règles standard qui s'appliquent au lieu de travail.

Tous les travaux doivent être effectués par un personnel qualifié possédant de bonnes connaissances par rapport au fonctionnement du matériel de soudage et de coupage plasma. Un fontionnement incorrect du matériel peut produire des situations dangereuses qui peuvent causer des blessures à l'opérateur ou des dommages au matériel.

1. Toute personne travaillant avec le matériel de soudage ou de coupage plasma doit connaître :
   - son fonctionnement;
   - l'emplacement des interrupteurs d'arrêt d'urgence;
   - sa fonction;
   - les précautions de sécurité pertinentes;
   - les procédures de soudage et/ou de coupage plasma.

2. L'opérateur doit assurer que :
   - seules les personnes autorisées à travailler sur l'équipement se trouvent dans l'aire de travail lors de la mise en marche de l'équipement;
   - toutes les personnes dans l'aire de travail sont protégées lorsque l'arc est amorcé.

3. Le lieu de travail doit être :
   - aménagé convenablement pour acquérir le matériel en toute sécurité;
   - libre de courants d'air.

4. Équipement de sécurité personnelle
   - Vous devez toujours utiliser un équipement de sécurité convenable tels que les lunettes de protection, les vêtement ininflammables et des gants de protection.
   - Vous ne devez jamais porter de vêtements amples, tels que foulards, bracelets, bagues, etc., qui pourraient se prendre dans l'appareil ou causer des brûlures.

5. Précautions générales :
   - Assurez-vous que le câble de retour est bien branché.
   - La réparation d'un équipement de haute tension **doit être effectuée par un électricien qualifié seulement**.
   - Un équipement d'extinction d'incendie approprié doit être à proximité de l'appareil et l'emplacement doit être clairement indiqué.
   - Vous **ne devez jamais** procéder à la lubrification ou l'entretien du matériel lorsque l'appareil est en marche.

MISE EN GARDE

Les appareils de classe A (400 V CE) ne sont pas prévus pour une utilisation sur des lieux résidentiels où l'alimentation électrique provient du réseau d'alimentation public basse tension. La compatibilité électromagnétique des appareils de classe A dans ces lieux est potentiellement perturbée en raison des perturbations rayonnées et conduites.

AVERTISSEMENT

LE SOUDAGE ET LE COUPAGE À L'ARC PEUVENT CAUSER DES BLESSURES À L'OPÉRATEUR OU LES AUTRES PERSONNES SE TROUVANT DANS L'AIRE DE TRAVAIL. ASSUREZ-VOUS DE PRENDRE TOUTES LES PRÉCAUTIONS NÉCESSAIRES LORS D'UNE OPÉRATION DE SOUDAGE OU DE COUPAGE. DEMANDEZ À VOTRE EMPLOYEUR UNE COPIE DES MESURES DE SÉCURITÉ QUI DOIVENT ÊTRE ÉLABORÉES À PARTIR DES DONNÉES DES RISQUE DU FABRICANT.

CHOC ÉLECTRIQUE - peut être mortel.
- Assurez-vous que l'unité de soudage ou de coupage plasma est installée et mise à la terre conformément aux normes applicables.
- Ne touchez pas aux pièces électriques sous tension ou les électrodes si vos mains ne sont pas bien protégées ou si vos gants ou vos vêtements sont humides.
- Assurez-vous que votre corps est bien isolé de la mise à la terre et de la pièce à traiter.
- Assurez-vous que votre position de travail est sécure.

VAPEURS ET GAZ - peuvent être danereux pour la santé.
- Gardez votre tête éloignée des vapeurs.
- Utilisez un système de ventilation et/ou d'extraction à l'arc pour évacuer les vapeurs et les gaz de votre zone respiratoire.

RAYONS DE L'ARC - peuvent endommager la vue ou brûler la peau.
- Protégez vos yeux et votre corps. Utilisez un écran de soudage/coupage plasma convenable équipé de lentilles teintées et portez des vêtements de protection.
- Protégez les personnes se trouvant dans l'aire de travail à l'aide d'un écran ou d'un rideau protecteur convenable.

RISQUE D'INCENDIE
- Les étincelles (projections) peuvent causer un incendie. Assurez-vous qu'il n'y a pas de matériel inflammable à proximité de l'appareil.

BRUIT - un bruit excessif peut endommager la capacité auditive.
- Protégez vos oreilles. Utilisez des protecteurs d'oreilles ou un autre type de protection auditive.
- Avertissez les personnes se trouvant dans l'aire de travail de ce risque.

FONCTIONNEMENT DÉFECTUEUX - Dans le cas d'un fonctionnement défectueux demandez l'aide d'une personne qualifiée.

ASSUREZ-VOUS DE LIRE ET DE COMPRENDRE LE MANUEL D'UTILISATION AVANT D'INSTALLER OU D'OPÉRER L'UNITÉ.

PROTÉGEZ-VOUS ET LES AUTRES !

POWERCUT-1250 / 1500

MANUAL PLASMARC CUTTING PACKAGE

1.0 GENERAL

WARNING

Use only the ESAB PT-32EH Plasmarc torch with this console. Use of torches not designed for use with this console could create an ELECTRIC SHOCK HAZARD.

The Powercut-1250 / 1500 is a compact, completely self-contained plasma cutting system. As shipped, the system is fully assembled and ready to cut after being connected to input power and a source of compressed air (90-150 psi / 6.2 to 10.3 bar). The Powercut package uses the heavy-duty PT-32EH (Manual Plasma) torch to deliver cutting power for severing materials up to 1-1/2 inch (38.1mm) thick on the PC-1250 and 1-3/4 inch (45mm) thick on the PC-1500. Refer to the following pages for descriptions of the Powercut packages available as well as performance specifications.

1.1 SCOPE

The purpose of this manual is to provide the operator with all the information required to install and operate the Powercut plasma arc cutting package. Technical reference material is also provided to assist in troubleshooting the cutting package.

Typical Front View

"Dual-Voltage" Version Back View

1.2 MANUAL PLASMA

1.2.1 PC-1250 MANUAL PLASMA

The PowerCut-1250 plasma cutting package combines the proven reliability of the PowerCut-1250 with the newly designed PT-32EH torch. The very strong composite case material makes the PowerCut-1250 an excellent addition to any equipment rental fleet. The PT-32EH plasma cutting torch is designed to provide increased performance and longer consumable life resulting in higher production rates at lower costs.

Specifications: PowerCut-1250

Cuts 1-1/4 in. (32mm); severs 1-1/2 in. (38mm)
1 ph. Input.....208/230 vac, 1 ph, 50/60 Hz, 67/61 A
1 ph. Output.....70 amps @ 60% duty cycle

3 ph. Input.....208/230 vac, 3 ph, 50/60 Hz, 33/29 A
.....230/460 vac, 3 ph, 50/60 Hz, 29/20 A
.....400 vac, 3 ph, 50/60 Hz, 18 A
.....575 vac, 3ph, 50/60 Hz, 15 A
3 ph. Output.....70 amps @ 100% duty cycle

Dimensions .....W = 12.5" (318mm)
.....H = 16.5" (419mm)
..... D = 31.5" (800mm)
Weight.....86 lbs. (39kg)
Air Requirements .....350 cfh @ 80 psig (165 l/min @ 5.5 bars)

Torch

PowerCut-1250 uses the PT-32EH torch. For complete list and breakdown of parts, refer to Figure 1.1.

Ordering Information:

PowerCut-1250, 208/230/460 V, 25' (7.6m) PT-32EH.....0558001933
PowerCut-1250, 208/230/460 V, 50' (15.2m) PT-32EH 0558001934
PowerCut-1250, 575 V, 25' (7.6m) PT-32EH.....0558001939
PowerCut-1250, 575 V, 50' (15.2m) PT- 32EH 0558001940
PowerCut-1250, 400 V, "CE" 25' (7.6m) PT-32EH 0558001936
PowerCut-1250, 400 V, "CE" 50' (15.2m) PT-32EH.....0558001937
PowerCut-1250, 460V, 25' (7.6m) PT-32EH.....0558005332
PowerCut-1250, 460V, 50' (15.2m) PT-32EH 0558005333

The components that are included in the Powercut-1250 packages (Console, Torch, Spare Parts Kit) may be purchased separately by using the appropriate P/N when placing orders. Individual part numbers are listed below:

Consoles:
PowerCut-1250 (208)230/460 V, 50/60 Hz, 1/3-ph 0558001935
PowerCut-1250 (208)230/460 V, 50/60 Hz, 1/3-ph (BL) 0558001935F
PowerCut-1250 575 V, 50/60 Hz, 3-ph.....0558001941
PowerCut-1250 400 V, CE, 50 Hz, 3-ph.....0558001938
PowerCut-1250 460 V, 60 Hz, 3-ph 0558005331

PT-32EH Torches:
PT-32EH Torch, 25-ft. (7.6m) 0558003548
PT-32EH Torch, 50-ft. (15.2m) 0558003549

Spare Parts Kits: (see section 1.2.3)
PT-32EH Spare Parts Kit 0558003508
PT-32EH, 400 V Long Heat Shield (LHS), Spare Parts Kit, CE units .....
only.....0558003560

PT-32EH Cut Data-70 AMPS

Powercut-1250, PT-32EH, 70A Nozzle P/N 0558002618
Air Pressure - 80 psi, 5/32" Standoff

	Max Speeds *Carbon Steel*	
Plate *Inches (mm)*	***Drop Cut*** *IPM (mm/min)*	***Sever*** *IPM (mm/min)*
0.250 (6.35)	*131(3327.4)*	*135 (3429)*
0.500 (12.7)	*50 (1270)*	*53 (1346.2)*
0.750 (19.05)	*21 (533.4)*	*23 (584.2)*
1.000 (25.4)	*10 (254)*	*12 (304.8)*
1.250 (31.75)	*6 (152.4)*	*7 (177.8)*
1.500 (38.1)	*--- (---)*	*3 (76.2)*

1.2.2 PC-1500 MANUAL PLASMA

The PowerCut-1500 plasma cutting package combines the proven reliability of the PowerCut-1500 with the newly designed PT-32EH torch. The very strong composite case material makes the PowerCut-1500 an excellent addition to any equipment rental fleet. The PT-32EH plasma cutting torch is designed to provide increased performance and longer consumable life resulting in higher production rates at lower costs.

Specifications: PowerCut-1500

Cuts 1-1/2 in. (38mm); severs 1-3/4 in. (45mm)
1 ph. Input.....208/230 vac, 1 ph, 50/60 Hz, 82/74 A
1 ph. Output.....90 amps @ 40% duty cycle

3 ph. Input.....208/230 vac, 3 ph, 50/60 Hz, 44/40 A
.....230/460 vac, 3 ph, 50/60 Hz, 40/27 A
.....400 vac, 3ph, 50/60 Hz, 26 A
400V CE Mains Supply ..... $S_{sc\,min}$ 3.8MVA
..... Z_{max} 0.042Ω
.....575 vac, 3ph, 50/60 Hz, 18 A
3 ph. Output.....90 amps @ 60% duty cycle

Dimensions .....W = 12.5" (318mm)
.....H = 16.5" (419mm)
..... D = 31.5" (800mm)
Weight.....94 lbs. (42.7kg)
Air Requirements .....350 cfh @ 80 psig (165 l/min @ 5.5 bars)

400V CE Mains Supply, $S_{sc\,min}$
Minimum short circuit power on the network in accordance with IEC61000-3-12.

400V CE Mains Supply, Z_{max}
Maximum permissible line on the network impedance in accordance with IEC61000-3-11.

Torch

PowerCut-1500 uses the PT-32EH torch. For complete list and breakdown of parts, refer to Figure 1.1.

PT-32EH Cut Data-90 AMPS

Powercut-1500, PT-32EH, 90A Nozzle P/N 0558002837
Air Pressure - 80 psi, 5/32" Standoff

	Max Speeds *Carbon Steel*	
Plate *Inches (mm)*	***Drop Cut*** *IPM (mm/min)*	***Sever*** *IPM (mm/min)*
0.250 (6.35)	*151 (3835.4)*	*153 (3886.2)*
0.500 (12.7)	*56 (1422.4)*	*58 (1473.2)*
0.750 (19.05)	*25 (635)*	*26 (660.4)*
1.000 (25.4)	*16 (406.4)*	*18 (457.2)*
1.250 (31.75)	*11 (279.4)*	*12 (304.8)*
1.500 (38.1)	*7 (177.8)*	*8 (203.2)*

Ordering Information:

PowerCut-1500, 230/460 V, 25' (7.6m) PT-32EH.....0558001942
PowerCut-1500, 230/460 V, 50' (15.2m) PT-32EH 0558001943
PowerCut-1500, 575 V, 25' (7.6m) PT-32EH.....0558001948
PowerCut-1500, 575 V, 50' (15.2m) PT- 32EH 0558001949
PowerCut-1500, 400 V, "CE" 25' (7.6m) PT-32EH 0558001945
PowerCut-1500, 400 V, "CE" 50' (15.2m) PT-32EH.....0558001946
PowerCut-1500, 460 V, 25' (7.6m) PT-32EH.....0558005902
PowerCut-1500, 460 V, 50' (15.2m) PT- 32EH 0558005903
PowerCut-1500, 400 V, 25' (7.6m) PT-32EH.....0558007827

The components that are included in the Powercut-1500 packages (Console, Torch, Spare Parts Kit) may be purchased separately by using the appropriate P/N when placing orders. Individual part numbers are listed below:

Consoles:
PowerCut-1500 (208)230/460 V, 50/60 Hz, 1/3-ph 0558003570
PowerCut-1500 (208)230/460 V, 50/60 Hz, 1/3-ph (BL) 0558003517
PowerCut-1500 575 V, 50/60 Hz, 3-ph.....0558001950
PowerCut-1500 400 V, CE, 50 Hz, 3-ph 0558001947
PowerCut-1500 460 V, 50/60 Hz, 3-ph.....0558005900
PowerCut-1500 400 V, 50 Hz, 3-ph 0558007826

PT-32EH Torches:
PT-32EH Torch, 25-ft. (7.6m).....0558003548
PT-32EH Torch, 50-ft. (15.2m) 0558003549

Spare Parts Kits: (see section 1.2.3)
PT-32EH Spare Parts Kit 0558003062
PT-32EH, 400 V Long Heat Shield (LHS), Spare Parts Kit, CE units only.....
.....0558003557

1.2.3 SPARE PARTS / OPTIONAL ACCESSORIES (PC-1250 / 1500 MANUAL PLASMA)

Spare Parts Kits:

Contents of PT-32EH Spare Parts Kit, 70 amp P/N 0558003508

Description	P/N	Quantity
Heat Shield	0558001957	2
70 amp Nozzle	0558002618	4
40 amp drag Nozzle	0558002908	1
Electrode	0558001969	3
Valve Pin	0558001959	1
Fuse 2amp, 600vdc	0558001379	1
Stand-off Guide	0558002393	1
Wrench	19129 (0558000808)	1
Lubricant	17672 (0558000443)	1

Contents of PT-32EH (LHS) Spare Parts Kit, 70 amp P/N 0558003560, "CE"units only

Description	P/N	Quantity
Long Heat Shield (LHS)	0558003110	2
70 amp Nozzle	0558002618	4
40 amp drag Nozzle	0558002908	1
Electrode	0558001969	3
Valve Pin	0558001959	1
Fuse 2amp, 600vdc	0558001379	1
Stand-off Guide	0558002393	1
Wrench	19129 (0558000808)	1
Lubricant	17672 (0558000443)	1

The PowerCut-1250 comes out of the box ready to go. The torch is attached with parts in place, primary cord is attached and the filter/regulator is installed. Just hook up the air, power and begin cutting.

(NOTE: Part numbers in parenthesis apply to "CE"/European units only.)

Contents of PT-32EH Spare Parts Kit, 90 amp P/N 0558003062

Description	P/N	Quantity
Heat Shield	0558001957	2
90 amp Nozzle	0558002837	4
40 amp drag Nozzle	0558002908	1
Electrode	0558001969	3
Valve Pin	0558001959	1
Fuse 2amp, 600vdc	0558001379	1
Stand-off Guide	0558002393	1
Wrench	19129 (0558000808)	1
Lubricant	17672 (0558000443)	1

Contents of PT-32EH (LHS) Spare Parts Kit, 90 amp P/N 0558003557, "CE" units only

Description	P/N	Quantity
Long Heat Shield (LHS)	0558003110	2
90 amp Nozzle	0558002837	4
40 amp drag Nozzle	0558002908	1
Electrode	0558001969	3
Valve Pin	0558001959	1
Fuse 2amp, 600vdc	0558001379	1
Stand-off Guide	0558002393	1
Wrench	19129 (0558000808)	1
Lubricant	17672 (0558000443)	1

The PowerCut-1500 comes out of the box ready to go. The torch is attached with parts in place, primary cord is attached and the filter/regulator is installed. Just hook up the air, power and begin cutting.

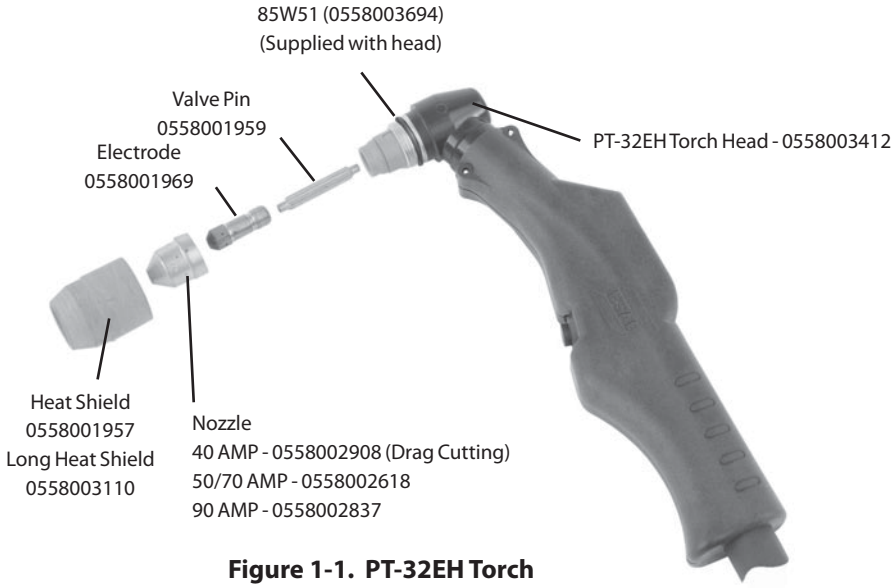


Figure 1-1. PT-32EH Torch

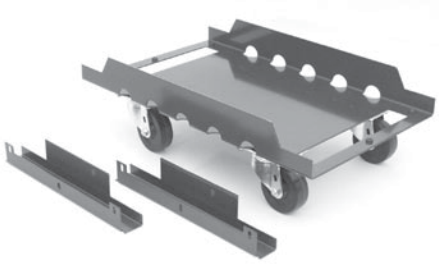
Optional Accessories:

70 A Spare Parts Kit 0558003508
70 A 400 V LHS Spare Parts Kit, "CE" units 0558003560
90 A Spare Parts Kit 0558003062
90 A 400 V LHS Spare Parts Kit, "CE" units 0558003557
Plasma Flow Measuring Kit:
This valuable troubleshooting tool allows measurement of the actual plasma gas flow through the torch 19765 (0558000739)
Torch Guide Kit:
This complete kit, in a rugged plastic carrying case, includes attachments for circle and straight line cutting on ferrous and non-ferrous metals,
Deluxe, 1 3/4" - 42" (44.5mm - 1066.8 mm) Radius 0558003258
Basic, 1 3/4" - 28" (44.5mm - 711.2 mm) Radius 0558002675
Stand-off Guide
For proper stand-off distance when drag cutting 0558002393
40 amp Drag Nozzle 0558002908
Gouging Nozzle 0558003089
Heat Shield Gouging 0558003090
Drag Heat Shield (Standard) 0558003374
Drag Heat Shield (Heavy Duty) 0558004206
Wheel Kit
For easy transport of system 0558003060
Torch Wrap
This enables operator to store spare parts kit, wrap torch and work cable for easy transport and storage 0558003059

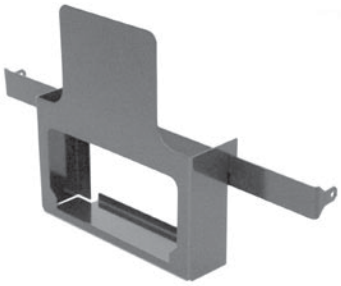
(NOTE: Part numbers in parenthesis apply to "CE"/European units only.)

Drag Heat Shield (Standard)
Maintains a constant stand-off, Good life in most applications 0558003374

Drag Heat Shield (Heavy Duty)
Maintains a constant stand-off, Long life, Suitable for piercing 0558004206



Wheel Kit
For easy transport of system 0558003060



Torch Wrap
This enables operator to store spare parts kit, wrap torch and work cable for easy transport and storage 0558003059

Powercut shown with Optional Torch Wrap and Spare Parts Kit Holder installed.

2.0 INSTALLATION - MANUAL PLASMA CUTTING PACKAGE

2.1 GENERAL

Proper installation is important for satisfactory and trouble-free operation of the PowerCut cutting package. It is suggested that each step in this section be studied carefully and followed closely.

CAUTION

Installing or placing any type of filtering device will restrict the volume of intake air, thereby subjecting the power source internal components to overheating. The warranty is void if any type of filter device is used.

2.2 EQUIPMENT REQUIRED

A source of clean, dry air that supplies 350 cfh (165.2 l/m) at 80 psig (5.5 bar) is required for the cutting operation. The air supply should not exceed 150 psig (10.3 bar) (the maximum inlet pressure rating of the air filter-regulator supplied with the package).

2.3 LOCATION

Adequate ventilation is necessary to provide proper cooling of the PowerCut. The amount of dirt, dust, and excessive heat to which the equipment is exposed, should be minimized. There should be at least one foot of clearance between the PowerCut power source and wall or any other obstruction to allow freedom of air movement through the power source.

2.4 INSPECTION

A. Remove the shipping container and all packing material and inspect for evidence of concealed damage which may not have been apparent upon receipt of the PowerCut. Notify the carrier of any defects or damage at once.

B. Check container for any loose parts prior to disposing of shipping materials.

C. Check air louvers and any other openings to ensure that any obstruction is removed.

WARNING

ELECTRIC SHOCK CAN KILL! Precautionary measures should be taken to provide maximum protection against electrical shock. Be sure that all power is off by opening the line (wall) disconnect switch and by unplugging the power cord to the unit when connections are made inside of the power source.

2.5 PRIMARY ELECTRICAL INPUT CONNECTIONS - MANUAL PLASMA CUTTING PACKAGE

The PowerCut-1250 / 1500 consoles are equipped with approximately 10-ft. of 4-conductor input power cable for 3-phase connection. If single-phase connection is desired, tape back the red (lt. blue) wire on the input power cable. Connect the single-phase input to the white and black wires only. When operating this machine from a single-phase source, it must be connected to a dedicated 100 Amp feed. Due to the higher input current requirements, the duty cycle of the machine is lower than in three-phase operation. Single phase duty cycle is 60% for PC-1250 and 40% for PC-1500.

Connect your air supply to the inlet connection of the filter-regulator.

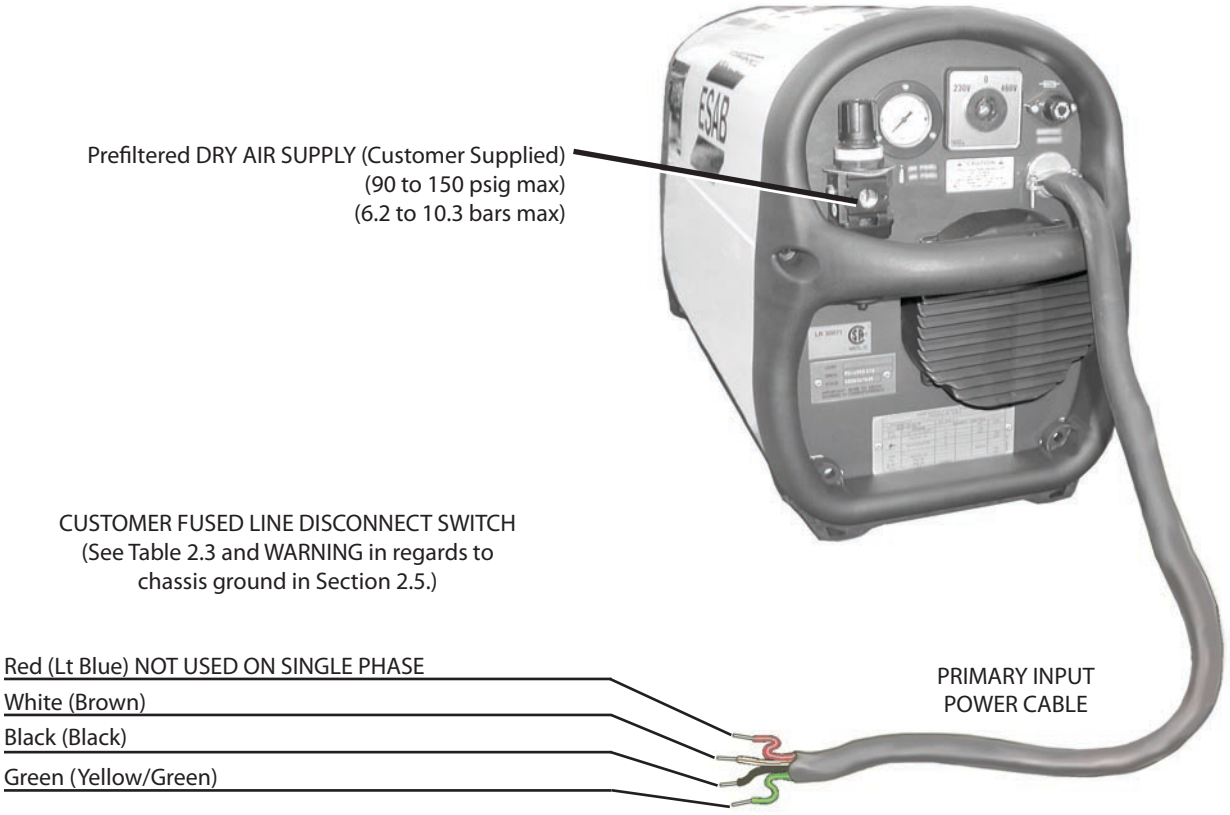

Prefiltered DRY AIR SUPPLY (Customer Supplied)
(90 to 150 psig max)
(6.2 to 10.3 bars max)
CUSTOMER FUSED LINE DISCONNECT SWITCH
(See Table 2.3 and WARNING in regards to
chassis ground in Section 2.5.)
Red (Lt Blue) NOT USED ON SINGLE PHASE
White (Brown)
Black (Black)
Green (Yellow/Green)
PRIMARY INPUT
POWER CABLE

Figure 2-1. Input Connections

WARNING

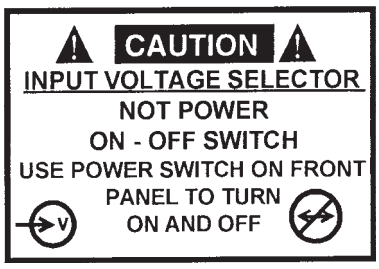
ELECTRIC SHOCK CAN KILL! Before making electrical input connections to the power source, "Machinery Lockout Procedures" should be employed. If the connections are to be made from a line disconnect switch, place the switch in the off position and padlock it to prevent inadvertent tripping . If the connection is made from a fusebox, remove the corresponding fuses and padlock the box cover. If it is not possible to use padlocks, attach a red tag to the line disconnect switch (or fuse box) warning others that the circuit is being worked on.

WARNING

The chassis must be connected to an approved electrical ground. Failure to do so may result in electrical shock, severe burns or death.

WARNING

Before making any connections to the power source output terminals, make sure that all primary input power to the power source is deenergized (off) at the main disconnect switch and that the input power cable is unplugged.



Before connecting to input power, make sure there is a line (wall) disconnect switch with fuses or circuit breakers at the main power panel. You may either use the factory-installed input power cable (4/c, type SO (90 °C), 10 ft (3.1 m) length) or provide your own input power leads. If you choose to provide your own, make sure they are insulated copper conductors. You must have two (single-phase) or three (three-phase) power leads and one ground wire. The wires may be heavy rubber covered cable or may be run in a solid or flexible conduit. Refer to Table 2-1 and 2-2 for recommended input conductors and line fuse sizes.

Table 2-1. (PC-1250) Recommended Sizes For Input Conductors and Line Fuses

Input Requirements			Input & Gnd	Fuse
Volts	Phase	Amps	Conductor	Size
			CU/AWG	Amps
208	1	67A	6	100
208	3	33A/Ph.	6	50
230	1	61A	6	100
230	3	29A/Ph.	6	50
460	3	20	6	50
400	3	18	$6mm^2$	50
575	3	15	10	25

Table 2-2. (PC-1500) Recommended Sizes For Input Conductors and Line Fuses

Input Requirements			Input & Gnd	Fuse
Volts	Phase	Amps	Conductor	Size
			CU/AWG	Amps
208	1	82A	6	100
208	3	44A/Ph.	6	80
230	1	74A	6	100
230	3	40A/Ph.	6	80
460	3	27	6	50
400	3	24	$6mm^2$	50
575	3	18	10	50

NOTE !!!

400V CE Mains Supply Requirements:

High power equipment may, due to the primary current drawn from the mains supply, influence the power quality of the grid. Therefore connection restrictions or requirements regarding the maximum permissible mains impedance or the required minimum supply capacity at the interface point to the public grid may apply for some types of equipment (see technical data). In this case it is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment may be connected.

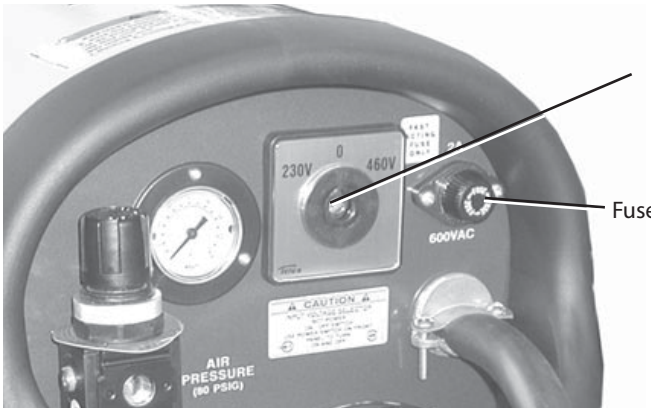
2.5.1 INPUT VOLTAGE CHANGEOVER - DUAL-VOLTAGE UNITS ONLY

208 - 230 or 460 Mode

To simplify the use of the ESAB Powercut-1250 / 1500 with different input voltages, it has been equipped with a convenient 230/460 selector switch located on the back panel of the unit. Switching between 230 and 460 voltages can be done by using a flathead screwdriver to turn the selector screw.

The Powercut is also equipped with protective fuse that will prevent damage to the power source in the event that the input voltage switch is not set correctly and the unit is powered on.

A line (wall) disconnect switch with fuses or circuit breakers should be provided at the main power panel (see Table 2-1 / 2-2 for fuse sizes). The input power cable of the console may be connected directly to the disconnect switch or you may purchase a proper plug and receptacle from a local electrical supplier. If using plug/receptacle combination, see Table 2-1 / 2-2 for recommended input conductors for connecting receptacle to line disconnect switch.



2.6 SECONDARY OUTPUT CONNECTIONS FOR MANUAL CUTTING

The torch comes factory installed.

POWERCUT 1250
Clamp the work cable to the workpiece. Be sure the workpiece is connected to an approved earth ground with a properly sized ground cable.
WORK
SAFETY GROUND
PT-32EH

Figure 2-2. PowerCut Interconnection Diagram

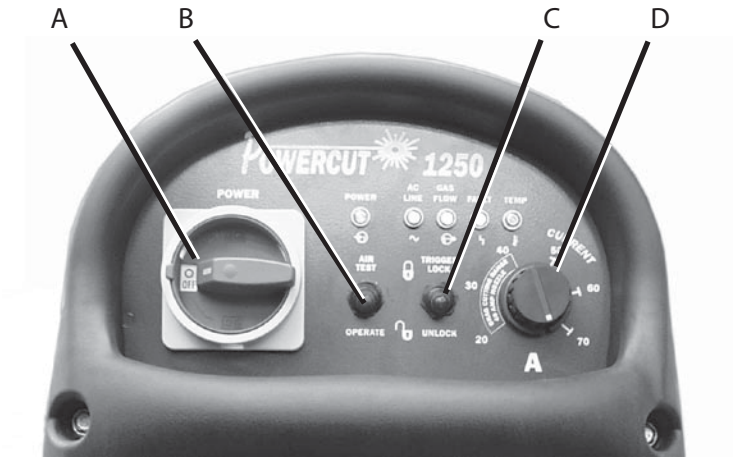


Figure 3-1A. PowerCut-1250 / 1500 Controls

3.0 OPERATION

3.1 PowerCut-1250 / 1500 CONTROLS

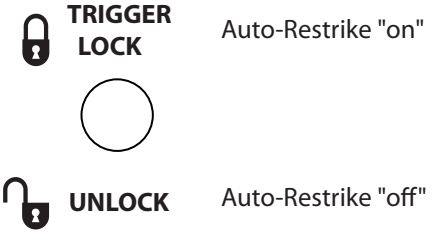
A. **Power Switch.** When placed in ON position, the white power light will glow indicating control circuit is energized.

B. **Air Test Switch.** When placed in TEST position, air filter-regulator can be adjusted to desired pressure (80 psig / 5.5 bar) before cutting operations. Allow air to flow for a few minutes. This should remove any condensation that may have accumulated during shutdown period. Be sure to place switch in OPERATE position before starting cutting operations.

C. **Trigger Lock Switch.**

1. **Manual Operation** using the PT-32EH torch - When placed in LOCK position, this permits releasing torch switch button after cutting arc has been initiated. To extinguish arc at end of cut, press and release torch switch button again or pull torch away from work. When placed in UNLOCK position, torch switch must be held closed by the operator during the entire cutting operation and then released at the end of cut.

2. **Mechanized Operation** using the PT-21AMX torch - In mechanized operation the Trigger Lock function disabled. Instead, the switch functions as an "Auto-Restrike" selector. To turn Auto-Restrike "on" (grate cutting), place the switch in the up position. To turn Auto-Restrike "off" (grate cutting), place the switch in the down position.



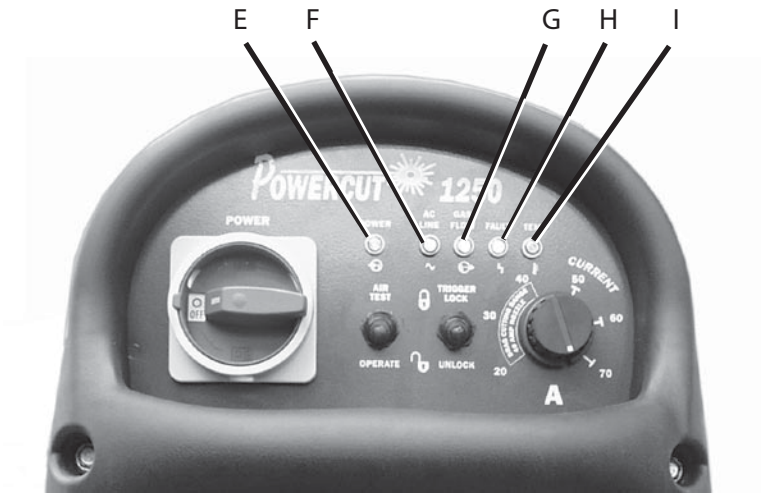


Figure 3-1B. PowerCut-1250 / 1500 Controls

D. Output Current Control. Adjustable from 20 to 70 amperes on Powercut-1250. Adjustable from 20 to 90 amperes on Powercut-1500.

E. Power "ON" Indicator: Illuminates whenever the front panel power switch is in the ON position.

F. AC Line Indicator or High/Low Line Voltage Indicator: This fault light will blink when the input voltage is outside the "+ or -" 15% range of the input rating.

G. Gas Flow Indicator: This fault light will blink when the air flow supply is low or has no back pressure.

H. Fault Indicator: When this light blinks, either the system failed to initiate a pilot arc after a number of attempts, or there has been an over-current event within the system. If the light blinks for 10 seconds and then stops, the problem is pilot arc initiation. Check the consumables in the torch.

If the light continues to blink, and the system does not reset, the fault is an over-current event. See troubleshooting section.

I. Over Temperature Indicator: This fault light will blink to indicate that the duty cycle has been exceeded. Allow the power source to cool down before returning to operation.

All fault signals will remain on for a minimum of 10 seconds. If fault clears, all will reset automatically except for over-current. To clear over-current, the power must be shut off for 5 seconds and then turned back on.

WARNING

ELECTRIC SHOCK can kill.

- **Do NOT operate the unit with the cover removed.**
- **Do NOT apply power to the unit while holding or carrying the unit.**
- **Do NOT touch any torch parts forward of the torch handle (nozzle, heat shield, electrode, etc.) with power switch on.**

WARNING

ARC RAYS can burn eyes and skin;
NOISE can damage hearing.

- **Wear welding helmet with No. 6 or 7 lens shade.**
- **Wear eye, ear, and body protection.**

3.2 PT-32EH TORCH USED WITH MANUAL PLASMA ONLY

3.2.1 CUTTING WITH THE POWERCUT-1250 / 1500 USING THE PT-32EH TORCH (MANUAL PLASMA ONLY)

Use the following procedures to cut with the PT-32EH torch.

A. Make sure that the wall disconnect switch is on. Turn on the Front Panel Power Switch.

B. Set Pressure Regulator to 80 psig (5.5 bar).

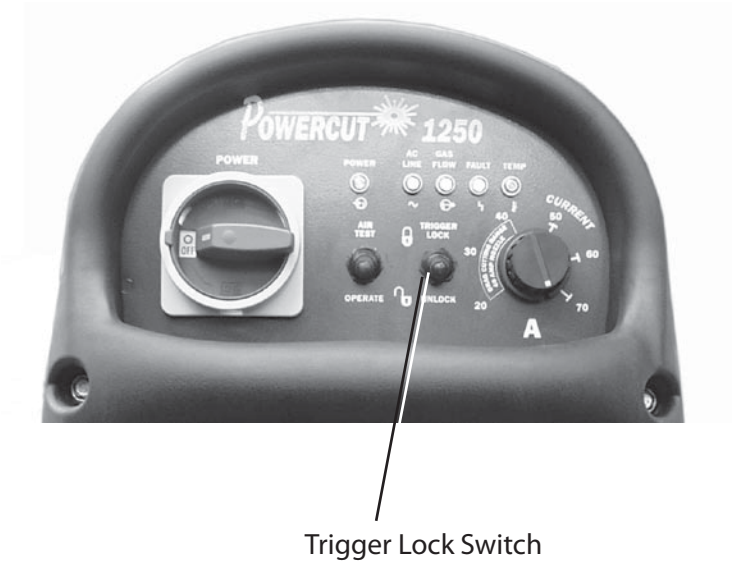
C. Hold the torch nozzle approximately 1/8 to 3/16 inch (3.2 to 4.8 mm) above the work and tilted at about 15 - 30°. This reduces the chance of spatter entering the nozzle. If the PT-32EH's stand-off guide (P/N 0558002393) is being used, the distance between Electrode and Work Piece will be approx. 3/16" (4.8 mm).

D. Depress the torch switch. Air should flow from the torch nozzle.

E. Two seconds after depressing the torch switch, the pilot arc should start. The main arc should immediately follow, allowing the cut to begin. (If using the trigger LOCK mode, torch switch may be released after establishing the cutting arc.) See note.

NOTE: Trigger Lock Switch.

Manual Operation using the PT-32EH torch - When placed in LOCK position, this permits releasing torch switch button after cutting arc has been initiated. To extinguish arc at end of cut, press and release torch switch button again or pull torch away from work. When placed in UNLOCK position, torch switch must be held closed by the operator during the entire cutting operation and then released at the end of cut.



Trigger Lock Switch

CAUTION

Position the PowerCut at least 10 feet (3 meters) from the cutting area. Sparks and hot slag from the cutting operation can damage the unit.

F. After starting the cut, the torch should be maintained at a 5-15° forward angle. This angle is especially useful in helping to create a "drop" cut. When not using the stand-off guide, the nozzle should be held approximately 1/4 inch (6.4mm) from the work.

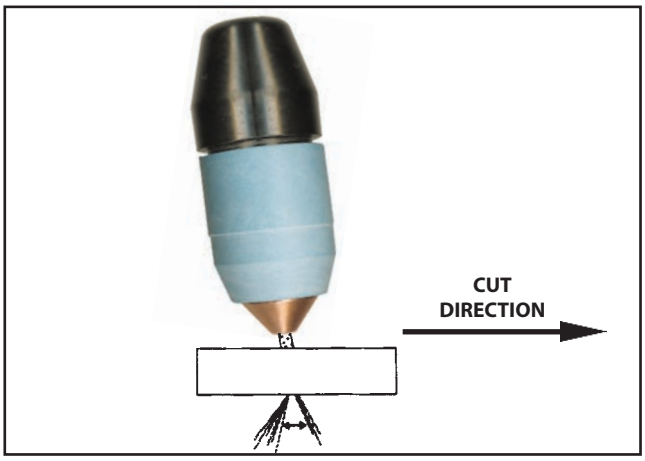


Figure 3-2a. Recommended Torch Angle of 5° to 15° During Cutting

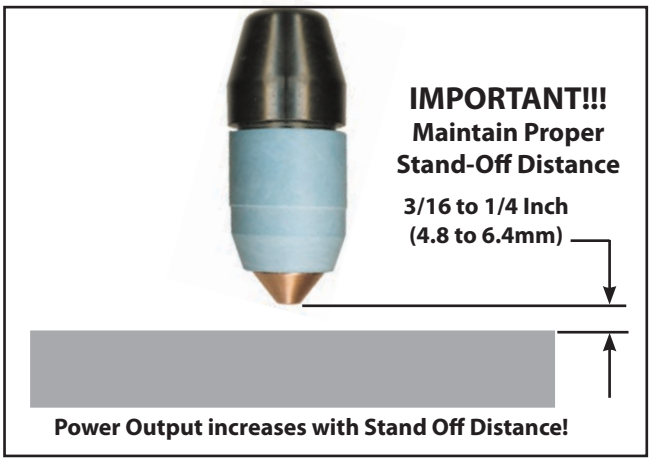


Figure 3-2b. Stand-off vs. Power Output During Cutting

G. When ending a cut, the torch switch should be released (press and release if using trigger LOCK mode) and the torch lifted off the workpiece just before the end of the cut. This is to prevent the high frequency from reigniting after cutting arc extinguishes and causing damage to the nozzle (double arcing).

H. For rapid re-starts, such as grate or heavy mesh cutting, do not release the torch switch. In the postflow mode, the arc can be re-started immediately by depressing the torch switch. This avoids the 2-second preflow portion of the cutting cycle.

CAUTION

Drag cutting, even with lower current levels may significantly reduce the life of torch consumables. Attempting to Drag Cut with higher currents greater than (40 amps) may cause immediate catastrophic consumable damage.

3.2.2 Drag Cutting with the PT-32EH Torch / PowerCut package.

A. LOW CURRENT AUTO-DRAG FEATURE
If drag cutting is desired for thin material under 3/8" (9.5mm) thick, remove the standard 70 / 90 amp nozzle from the PT-32EH torch and install ESAB's 40 amp nozzle. Lower the current level setting to be within the AUTO-DRAG range of 20 to 40 amps (see Auto Drag Scale on front panel). Then follow steps in Section 3.2.1. Also refer to PT-32EH Instruction Manual No. F-15-747.

B. HIGH CURRENT DRAG CUTTING
If drag cutting is desired on materials above 3/8" (9.5mm) thick, be sure that the 70 amp / 90 amp nozzle is installed in the PT-32EH torch. Attach ESAB's stand-off guide and operate as shown in Figure 3.3.

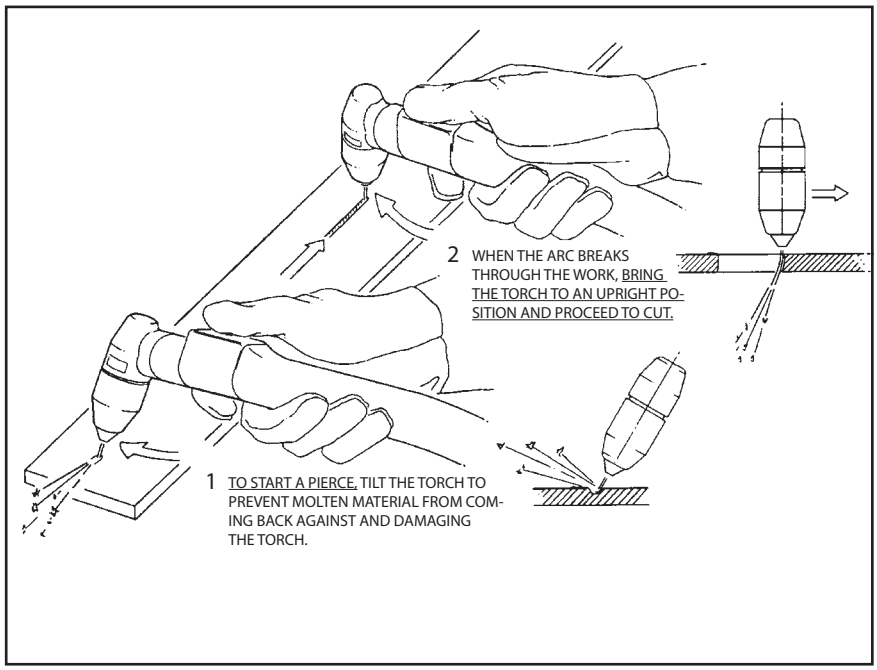

2 WHEN THE ARC BREAKS THROUGH THE WORK, BRING THE TORCH TO AN UPRIGHT POSITION AND PROCEED TO CUT.
1 TO START A PIERCE, TILT THE TORCH TO PREVENT MOLTEN MATERIAL FROM COMING BACK AGAINST AND DAMAGING THE TORCH.

Figure 3-3. Piercing Technique using the PT-32EH

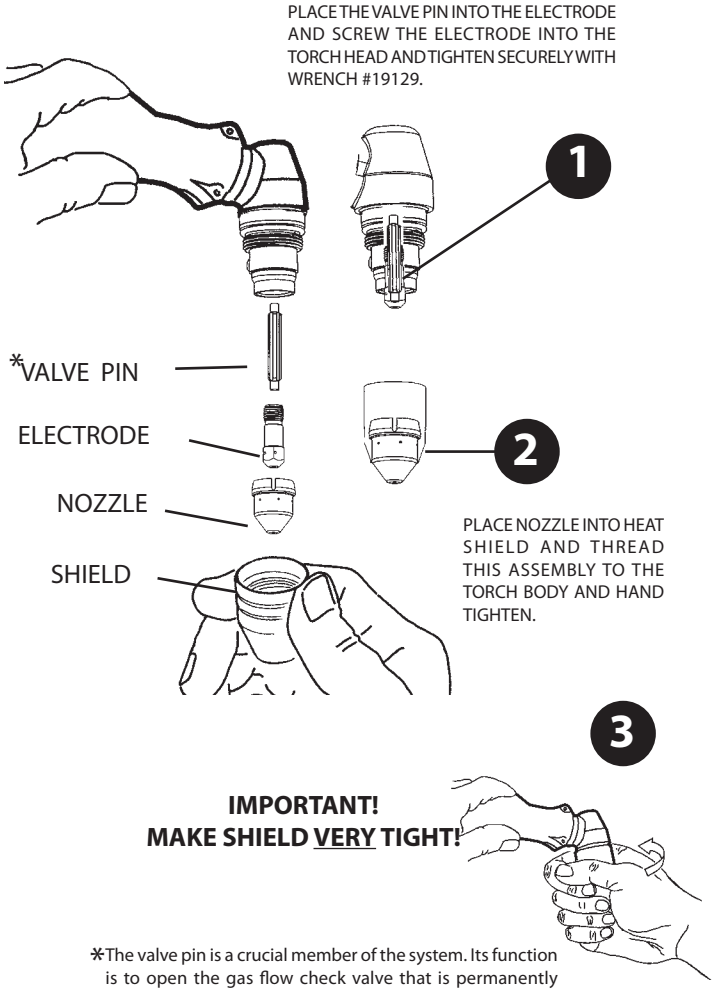
3.2.3 PT-32EH TORCH PARTS INSTALLATION (MANUAL PLASMA ONLY)

WARNING

Make sure power switch on POWERCUT is in OFF position before working on the torch.

WARNING

The PT-32EH torch head contains a gas flow check valve that acts in conjunction with the flow switch and circuitry within the power source. This system prevents the torch from being energized with high voltage if the torch switch is accidentally closed when the shield is removed. Always replace torch with the with the proper torch manufactured by ESAB since it alone contains ESAB's patented safety interlock.


PLACE THE VALVE PIN INTO THE ELECTRODE AND SCREW THE ELECTRODE INTO THE TORCH HEAD AND TIGHTEN SECURELY WITH WRENCH #19129.
1
*VALVE PIN
ELECTRODE
2
NOZZLE
PLACE NOZZLE INTO HEAT SHIELD AND THREAD THIS ASSEMBLY TO THE TORCH BODY AND HAND TIGHTEN.
SHIELD
3
IMPORTANT!
MAKE SHIELD VERY TIGHT!

*The valve pin is a crucial member of the system. Its function is to open the gas flow check valve that is permanently assembled within the torch head. If the pin is not correctly placed in the electrode, the valve will not open and the system will not function. The valve pin also improves electrode cooling by increasing the velocity of air over the inner surface of the electrode.

Fig 3.4. Exploded View of PT-32EH Torch

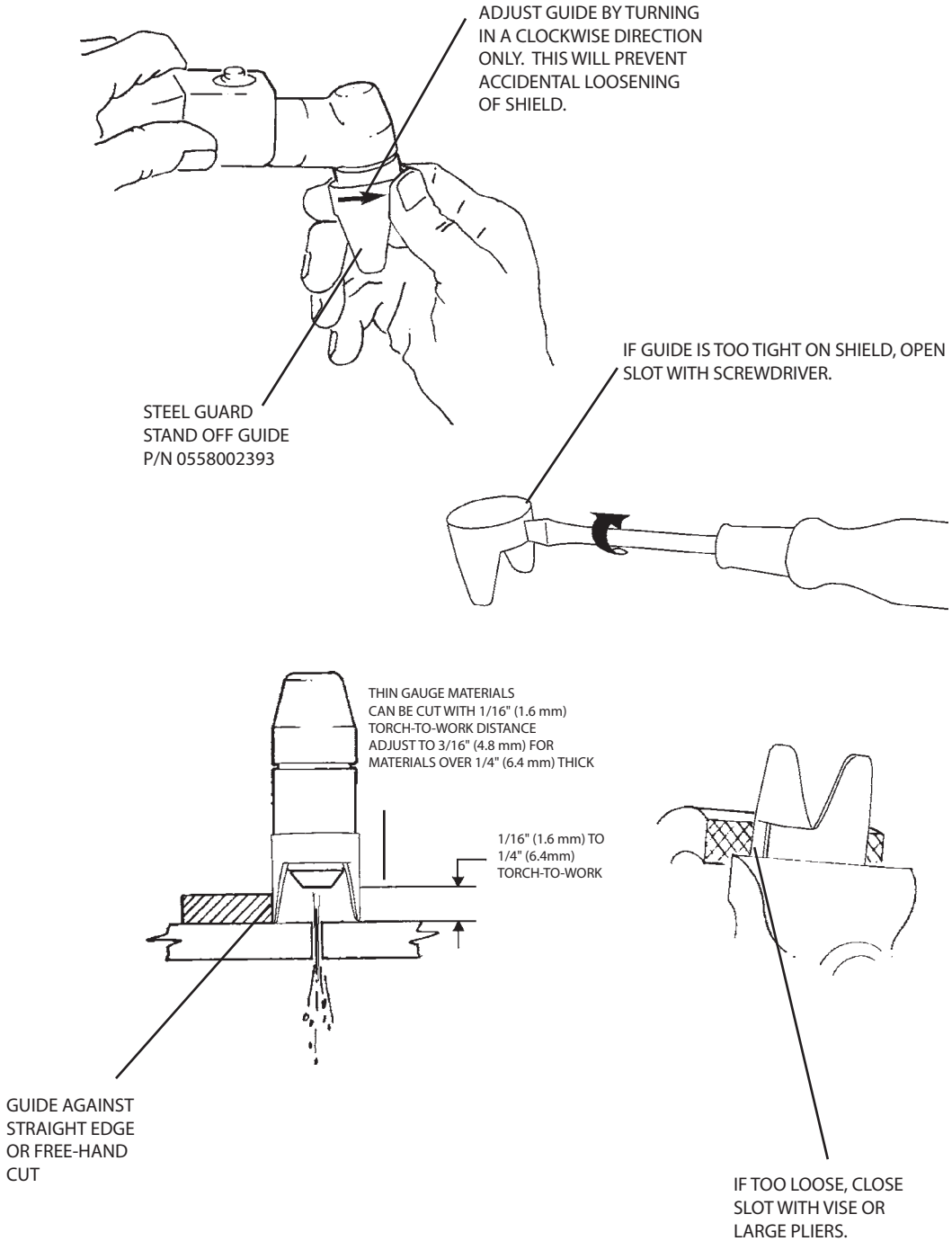

ADJUST GUIDE BY TURNING IN A CLOCKWISE DIRECTION ONLY. THIS WILL PREVENT ACCIDENTAL LOOSENING OF SHIELD.
STEEL GUARD STAND OFF GUIDE P/N 0558002393
IF GUIDE IS TOO TIGHT ON SHIELD, OPEN SLOT WITH SCREWDRIVER.
THIN GAUGE MATERIALS CAN BE CUT WITH 1/16" (1.6 mm) TORCH-TO-WORK DISTANCE ADJUST TO 3/16" (4.8 mm) FOR MATERIALS OVER 1/4" (6.4 mm) THICK
1/16" (1.6 mm) TO 1/4" (6.4mm) TORCH-TO-WORK
GUIDE AGAINST STRAIGHT EDGE OR FREE-HAND CUT
IF TOO LOOSE, CLOSE SLOT WITH VISE OR LARGE PLIERS.

Figure 3-5. Installation and Operation of Stand-off Guide (PT-32EH ONLY)

3.3 PT-32EH POSSIBLE CUTTING ISSUES

CAUTION

REPLACE ELECTRODE BEFORE PITTING BECOMES DEEPER THAN .06 INCH (1.5 MM)

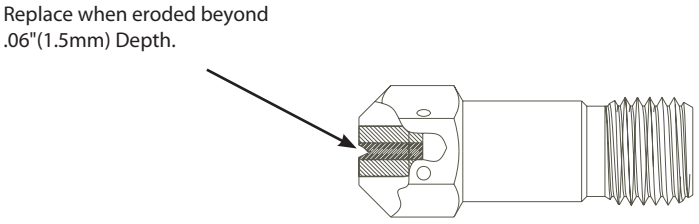


Figure 3-6. Electrode Wear Limit

NOTE: When replacing the nozzle, always inspect the electrode for wear. If more than .06" (1.5mm) of electrode has eroded, replace the electrode. If the electrode is used beyond this recommended wear limit, damage to the torch and power source may occur. Nozzle life is also greatly reduced when using the electrode below the recommended limit.

POWERCUT-1250 / 1500

MECHANIZED PLASMARC CUTTING PACKAGE

WARNING

Use only the ESAB PT-21AMX Plasmarc torch with this console. Use of torches not designed for use with this console could create an ELECTRIC SHOCK HAZARD.

1.0 GENERAL

The Powercut-1250 / 1500 is a compact, completely self-contained plasma cutting system. The system is shipped with the PT-21AMX mechanized torch. Torch must be wired to the console before operation. See section 2.6.1. The system is ready to cut after connections are made to the torch, input power and a source of compressed air (90-150 psi / 6.2 to 10.3 bar). The mechanized Powercut package uses the PT-21AMX mechanized plasma torch to deliver cutting power for severing materials up to 1-1/2 inch (38.1mm) thick on the PC-1250 and 1-3/4 inch (45mm) thick on PC-1500. Refer to the following pages for descriptions of the Powercut packages available as well as performance specifications.

1.1 SCOPE

The purpose of this manual is to provide the operator with all the information required to install and operate the Powercut plasma arc cutting package. Technical reference material is also provided to assist in troubleshooting the cutting package.

Typical Front View

"Dual-Voltage" Version Back View

1.2 MECHANIZED PLASMA

1.2.1 PC-1250 MECHANIZED PLASMA

The PowerCut-1250 plasma cutting package combines the proven reliability of the PowerCut-1250 with the newly designed PT-21AMX torch. The PT-21AMX plasma cutting torch is designed to provide increased performance and longer consumable life resulting in higher production rates at lower costs.

Specifications: PowerCut-1250

Cuts 1-1/4 in. (32mm)
1 ph. Input.....208/230 vac, 1 ph, 50/60 Hz, 67/61 A
1 ph. Output.....70 amps @ 60% duty cycle

3 ph. Input.....208/230 vac, 3 ph, 50/60 Hz, 33/29 A
.....230/460 vac, 3 ph, 50/60 Hz, 29/20 A
.....400 vac, 3 ph, 50/60 Hz, 18 A
.....575 vac, 3ph, 50/60 Hz, 15 A
3 ph. Output.....70 amps @ 100% duty cycle

Dimensions .....W = 12.5" (318mm)
.....H = 16.5" (419mm)
..... D = 31.5" (800mm)
Weight.....86 lbs. (39kg)
Air Requirements .....350 cfh @ 80 psig (165 l/min @ 5.5 bars)

Torch

PowerCut-1250 uses the PT-21AMX torch. For complete list and breakdown of parts, refer to Figure 1.2.

Ordering Information:

PowerCut-1250, 208/230/460 V, 25' (7.6m) PT-21AMX.....0558004185
PowerCut-1250, 208/230/460 V, 50' (15.2m) PT-21AMX.....0558004186
PowerCut-1250, 400 V, "CE" 25' (7.6m) PT-21AMX.....0558004187
PowerCut-1250, 400 V, "CE" 50' (15.2m) PT-21AMX.....0558004188
PowerCut-1250, 208/230/460 V, 25' (7.6m) PT-21NR.....0558005494
PowerCut-1250, 208/230/460 V, 50' (15.2m) PT-21NR.....0558005495
PowerCut-1250, 400 V, "CE" 25' (7.6m) PT-21NR.....0558005496
PowerCut-1250, 400 V, "CE" 50' (15.2m) PT-21NR.....0558005497

The components that are included in the Powercut-1250 packages (Console, Torch, Spare Parts Kit, Torch Holder Assembly & Interface Cable) may be purchased separately by using the appropriate P/N when placing orders. Individual part numbers are listed below:

Consoles:
PowerCut-1250 (208)230/460 V, 50/60 Hz, 1/3-ph.....0558004189
PowerCut-1250 400 V, CE, 50 Hz, 3-ph.....0558004190

PT-21AMX Torches:
Without Rack; 50 ft. (15.2m) 0558003615
With Rack; 50 ft. (15.2m) 0558003614
Without Rack; 25 ft.(7.6m).....0558003617
With Rack; 25 ft. (7.6m).....0558003616

Spare Parts Kits: (see section 1.2.3)
PT-21AMX Spare Parts Kit (50 Amp) 21370 (2461001)
PT-21AMX Spare Parts Kit (70 Amp) 21369 (0558000848)

PT-21AMX Cut Data-70 AMPS

Powercut-1250, PT-21AMX, 70A Nozzle P/N 21329 (4485834)
Air Pressure - 75-85 psi, 3/16" to 1/4" Standoff

	Max Speeds *Mild Steel*	
Plate *Inches (mm)*	***Optimum*** *IPM (mm/min)*	***Maximum*** *IPM (mm/min)*
0.125 (3.175)	*190 (4826)*	*210 (5334)*
0.250 (6.35)	*85 (2159)*	*101 (2565.4)*
0.500 (12.7)	*30 (762)*	*39 (990.6)*
0.750 (19.05)	*13 (330.2)*	*15 (381)*
1.000 (25.4)	*5 (127)*	*7 (177.8)*
1.250 (31.75)	*3 (76.2)*	*5 (127)*

(NOTE: Part numbers in parenthesis apply to "CE"/European units.)

1.2.2 PC-1500 MECHANIZED PLASMA

The PowerCut-1500 plasma cutting package combines the proven reliability of the PowerCut-1500 with the newly designed PT-21AMX torch. The PT-21AMX plasma cutting torch is designed to provide increased performance and longer consumable life resulting in higher production rates at lower costs.

(NOTE: Part numbers in parenthesis apply to "CE"/European units.)

Specifications: PowerCut-1500

Cuts 1-1/2 in. (38mm)
1 ph. Input.....208/230 vac, 1 ph, 50/60 Hz, 82/74 A
1 ph. Output.....90 amps @ 40% duty cycle

3 ph. Input.....208/230 vac, 3 ph, 50/60 Hz, 44/40 A
.....230/460 vac, 3 ph, 50/60 Hz, 40/27 A
.....400 vac, 3ph, 50/60 Hz, 26 A

400V CE Mains Supply ..... $S_{sc\,min}$ 3.8MVA
..... Z_{max} 0.042Ω

.....575 vac, 3ph, 50/60 Hz, 18 A
3 ph. Output.....90 amps @ 60% duty cycle

Dimensions .....W = 12.5" (318mm)
.....H = 16.5" (419mm)
..... D = 31.5" (800mm)
Weight.....94 lbs. (42.7kg)
Air Requirements .....350 cfh @ 80 psig (165 l/min @ 5.5 bars)

400V CE Mains Supply, $S_{sc\,min}$
Minimum short circuit power on the network in accordance with IEC61000-3-12.

400V CE Mains Supply, Z_{max}
Maximum permissible line on the network impedance in accordance with IEC61000-3-11.

Torch

PowerCut-1500 uses the PT-21AMX torch. For complete list and breakdown of parts, refer to Figure 1.2.

Ordering Information:

PowerCut-1500, 230/460 V, 25' (7.6m) PT-21AMX.....0558004191
PowerCut-1500, 230/460 V, 50' (15.2m) PT-21AMX.....0558004192
PowerCut-1500, 400 V, "CE" 25' (7.6m) PT-21AMX.....0558004193
PowerCut-1500, 400 V, "CE" 50' (15.2m) PT-21AMX.....0558004194
PowerCut-1500, 230/460 V, 25' (7.6m) PT-21NR 0558005490
PowerCut-1500, 230/460 V, 50' (15.2m) PT-21NR.....0558005491
PowerCut-1500, 400 V, "CE" 25' (7.6m) PT-21NR.....0558005492
PowerCut-1500, 400 V, "CE" 50' (15.2m) PT-21NR 0558005493

The components that are included in the Powercut-1500 packages may be purchased separately by using the appropriate P/N when placing orders. Individual part numbers are listed below:

Consoles:
PowerCut-1500 (208)230/460 V, 50/60 Hz, 1/3-ph 0558004195
PowerCut-1500 400 V, CE, 50 Hz, 3-ph.....0558004196

PT-21AMX Cut Data-90 AMPS

Powercut-1500, PT-21AMX, 90A Nozzle P/N 0558004269
Air Pressure - 85 psi, 3/16" to 1/4" Standoff

	Max Speeds *Mild Steel*	
Plate *Inches (mm)*	***Optimum*** *IPM (mm/min)*	***Maximum*** *IPM (mm/min)*
0.250 (6.35)	*120 (3048)*	*150 (3810)*
0.500 (12.7)	*49 (1244.6)*	*55 (1397)*
0.750 (19.05)	*22 (558.8)*	*25 (635)*
1.000 (25.4)	*12 (304.8)*	*13 (330.2)*
1.250 (31.75)	*7 (177.8)*	*9 (228.6)*
1.500 (38.1)	*3 (76.2)*	*5 (127)*

PT-21AMX Torches:
Without Rack; 50 ft. (15.2m) 0558003615
With Rack; 50 ft. (15.2m) 0558003614
Without Rack; 25 ft. (7.6m).....0558003617
With Rack; 25 ft. (7.6m).....0558003616

Spare Parts Kits: (see section 1.2.3)
PT-21AMX Spare Parts Kit (50 Amp) 21370 (2461001)
PT-21AMX Spare Parts Kit (70 Amp) 21369 (0558000848)
PT-21AMX Spare Parts Kit (90 Amp) .....
.....0558004271 (0558004277)

1.2.3 SPARE PARTS / OPTIONAL ACCESSORIES (PC-1250 / 1500 MECHANIZED PLASMA)

Contents of PT-21AMX Spare Parts Kit, P/N 21370 (2461001) 50 Amp

Description	STD P/N	(CE) P/N	Quantity
Heat Shield (50 A)	21447	(4485832)	2
Cutting Nozzle (50 A)	21330	(4485833)	5
Electrode	21150	(0558001617)	5
Electrode Insulator	21373	(4485837)	1
Electrode Holder Assy	21332	(4485840)	1
Baffle Tube	21374	(4485838)	1
Pilot Arc Adaptor	19497	(4485843)	1
O-ring	488157	(4485841)	5
Lubricant (1 oz.)	17672	(0558000443)	1
Seat/Baffle Wrench	21375	(4485842)	1
Hex-Key Wrench	93750006	(4485651)	1
Tool Box	950272	(0558004270)	1

Contents of PT-21AMX Spare Parts Kit, P/N 21369 (0558000848) 70 Amp

Description	STD P/N	(CE) P/N	Quantity
Heat Shield (70/90 A)	21326	(4485831)	2
Heat Shield (50 A)	21447	(4485832)	1
Cutting Nozzle (50 A)	21330	(4485833)	5
Cutting Nozzle (70 A)	21329	(4485834)	5
Electrode	21150	(0558001617)	5
Electrode Insulator	21373	(4485837)	1
Electrode Holder Assy	21332	(4485840)	1
Baffle Tube	21374	(4485838)	1
Pilot Arc Adaptor	19497	(4485843)	1
O-ring	488157	(4485841)	5
Lubricant (1 oz.)	17672	(0558000443)	1
Seat/Baffle Wrench	21375	(4485842)	1
Hex-Key Wrench	93750006	(4485651)	1
Tool Box	950272	(0558004270)	1

Contents of PT-21AMX Spare Parts Kit, P/N 0558004271 (0558004277) 90 Amp

Description	STD P/N	(CE) P/N	Quantity
Heat Shield (70/90 A)	21326	(4485831)	2
Heat Shield (50 A)	21447	(4485832)	1
Cutting Nozzle (50 A)	21330	(4485833)	5
Cutting Nozzle (70 A)	21329	(4485834)	5
Cutting Nozzle (90 A)	0558004269		5
Electrode	21150	(0558001617)	5
Electrode Insulator	21373	(4485837)	1
Electrode Holder Assy	21332	(4485840)	1
Baffle Tube	21374	(4485838)	1
Pilot Arc Adaptor	19497	(4485843)	1
O-ring	488157	(4485841)	5
Lubricant (1 oz.)	17672	(0558000443)	1
Seat/Baffle Wrench	21375	(4485842)	1
Hex-Key Wrench	93750006	(4485651)	1
Tool Box	950272	(0558004270)	1

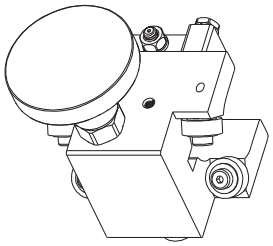
Optional Accessories:

Torch Holder Assembly 16V83 (0558004250)
50 amp Spare Parts Kit 21370 (2461001)
70 amp Spare Parts Kit 21369 (0558000848)
90 amp Spare Parts Kit 0558004271 (0558004277)

CNC Cable 50' 57002249

Plasma Flow Measuring Kit
This valuable troubleshooting tool allows measurement of the actual plasma gas flow through the torch 19765 (0558000739)

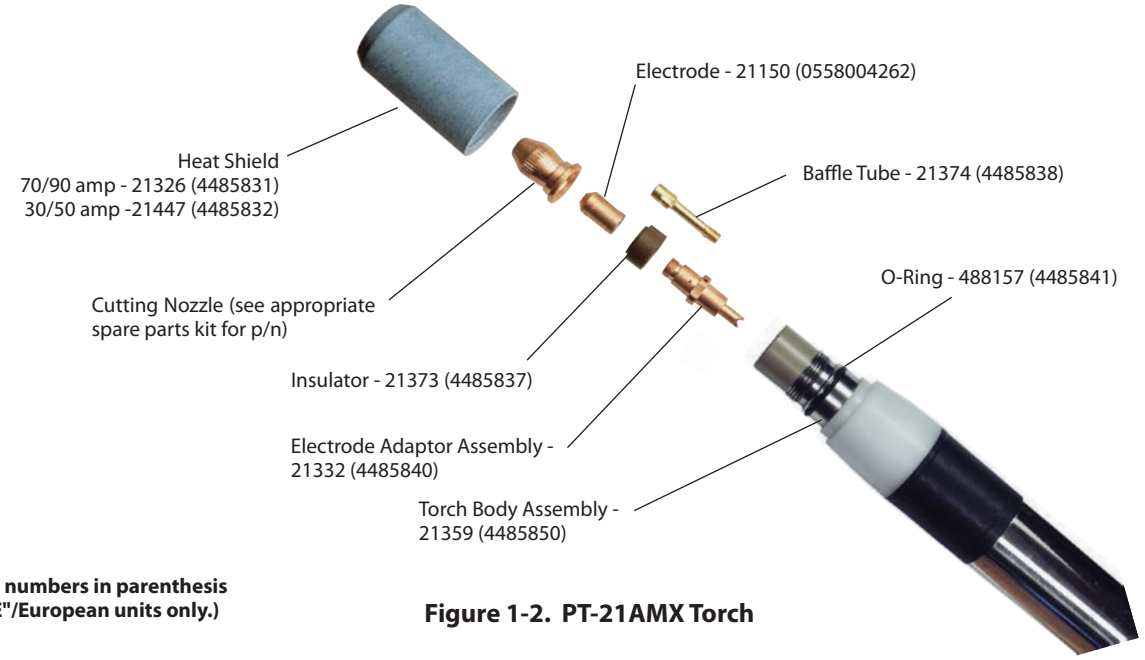
(NOTE: Part numbers in parenthesis apply to "CE"/European units only.)



Torch Holder Assy 0558005926

Remote Hand Control Switch with 25 ft. (7.6m) lead for PT-21AMX 0558003612

Plasma Flow Measuring Kit 19765 (0558000739)


Electrode - 21150 (0558004262)
Heat Shield
70/90 amp - 21326 (4485831)
30/50 amp -21447 (4485832)
Baffle Tube - 21374 (4485838)
O-Ring - 488157 (4485841)
Cutting Nozzle (see appropriate spare parts kit for p/n)
Insulator - 21373 (4485837)
Electrode Adaptor Assembly - 21332 (4485840)
Torch Body Assembly - 21359 (4485850)

(**NOTE: Part numbers in parenthesis apply to "CE"/European units only.)**

Figure 1-2. PT-21AMX Torch

Cutting Parameters for the PT-21AMX Torch

90AMP Data, Nozzle P/N 0558004269,
Heat Shield P/N 21326 (4485831)

Metal Thickness		Air Pressure		Stand-Off		Arc Voltage	Pierce Time
in.	mm	psig	bar	in.	mm	DC Volts	seconds
0.25	6	85	6	.188	5	110	0.1
0.50	13	85	6	.188	5	120	0.3
0.75	19	85	6	.188	5	125	1.0
1.00	25	85	6	.250	6	130	2.75
1.25	32	85	6	.250	6	140	NR
1.50	38	85	6	.250	6	145	NR

"NR" indicates piercing is not recommended

Metal Thickness		Travel Speed											
		Mild Steel				Aluminum				Stainless			
		Maximum		Optimum		Maximum		Optimum		Maximum		Optimum	
in.	mm	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)
0.25	6	150	3810	120	3048	125	3175	105	2667	88	2235.2	80	2032
0.50	13	55	1397	49	1244.6	61	1549.4	51	1295.4	37	939.8	31	787.4
0.75	19	25	635	22	558.8	35	889	31	787.4	15	381	13	330.2
1.00	25	13	330.2	12	304.8	20	508	15	381	10	254	8	203.2
1.25	32	9	228.6	7	177.8	13	330.2	10	254	7	177.8	5	127
1.50	38	5	127	3	76.2	10	254	7	177.8	3	76.2	3	76.2

Cutting Parameters for the PT-21AMX Torch

70AMP Data, Nozzle P/N 21329 (4485834), Heat Shield P/N 21326 (4485831)

Metal Thickness		Air Pressure		Stand-Off		Arc Voltage	Pierce Time
in.	mm	psig	bar	in.	mm	DC Volts	seconds
.125	3	75	5	.188	5	105	0.1
.250	6	75	5	.188	5	110	0.2
.500	13	85	6	.188	5	115	0.6
.750	19	85	6	.188	5	125	2.3
1.000	25	85	6	.250	6	135	NR
1.250	32	85	6	.250	6	150	NR

"NR" indicates piercing is not recommended

Metal Thickness		Travel Speed											
		Mild Steel				Aluminum				Stainless			
		Maximum		Optimum		Maximum		Optimum		Maximum		Optimum	
in.	mm	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)
.125	3	210	5334	190	4826	205	5207	185	4699	91	2311.4	80	2032
.250	6	101	2565.4	85	2159	100	2540	90	2286	61	1549.4	55	1397
.500	13	39	990.6	30	762	39	990.6	31	787.4	23	584.2	20	508
.750	19	15	381	13	330.2	25	635	20	508	12	304.8	9	228.6
1.000	25	7	177.8	5	127	12	304.8	9	228.6	7	177.8	6	152.4
1.250	32	5	127	3	76.2	9	228.6	5	127	3	76.2	3	76.2

40/50AMP Data, Nozzle P/N 21330 (4485833), Heat Shield P/N 21447 (4485832)

Metal Thickness		Air Pressure		Stand-Off		Arc Voltage	Pierce Time	Arc Current
in.	mm	psig	bar	in.	mm	DC Volts	seconds	amps
0.063	2	75	5	.125	3	110	0	40
0.125	3	75	5	.125	3	110	0.1	40
0.188	5	85	6	.125	3	110	0.2	50
0.250	6	85	6	.188	5	120	0.4	50
0.375	10	85	6	.188	5	125	0.6 / NR	50
0.500	13	85	6	.188	5	135	0.8 / NR	50

"NR" indicates piercing is not recommended

Metal Thickness		Travel Speed											
		Mild Steel				Aluminum				Stainless			
		Maximum		Optimum		Maximum		Optimum		Maximum		Optimum	
in.	mm	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)	ipm	(mm/min)
0.063	2	170	4318	155	3937	161	4089.4	150	3810	141	3581.4	130	330.2
0.125	3	112	2844.8	100	2540	141	3581.4	110	2794	79	2006.6	75	1905
0.188	5	111	2819.4	102	2590.8	105	2667	93	2362.2	57	1447.8	50	1270
0.250	6	71	1803.4	66	1676.4	83	2108.2	77	1955.8	37	939.8	30	762
0.375	10	43	1092.2	40	1016	37	939.8	31	787.4	15	381	10	254
0.500	13	21	533.4	18	457.2	13	330.2	9	228.6	11	279.4	8	203.2

(NOTE: Part numbers in parenthesis apply to "CE"/European units only.)

2.0 INSTALLATION - MECHANIZED PLASMA CUTTING PACKAGE

CAUTION

Installing or placing any type of filtering device will restrict the volume of intake air, thereby subjecting the power source internal components to overheating. The warranty is void if any type of filter device is used.

2.1 GENERAL

Proper installation is important for satisfactory and trouble-free operation of the PowerCut cutting package. It is suggested that each step in this section be studied carefully and followed closely.

2.2 EQUIPMENT REQUIRED

A source of clean, dry air that supplies 350 cfh at 80 psig (165.1 i/m @ 5.5 bars) is required for the cutting operation. The air supply should not exceed 150 psig (10.3 bars) (the maximum inlet pressure rating of the air filter-regulator supplied with the package).

2.3 LOCATION

Adequate ventilation is necessary to provide proper cooling of the PowerCut. The amount of dirt, dust, and excessive heat to which the equipment is exposed, should be minimized. There should be at least one foot of clearance between the PowerCut power source and wall or any other obstruction to allow freedom of air movement through the power source.

2.4 INSPECTION

A. Remove the shipping container and all packing material and inspect for evidence of concealed damage which may not have been apparent upon receipt of the PowerCut. Notify the carrier of any defects or damage at once.

B. Check container for any loose parts prior to disposing of shipping materials.

C. Check air louvers and any other openings to ensure that any obstruction is removed.

2.5 PRIMARY ELECTRICAL INPUT CONNECTIONS - MECHANIZED PLASMA CUTTING PACKAGE

WARNING

ELECTRIC SHOCK CAN KILL! Precautionary measures should be taken to provide maximum protection against electrical shock. Be sure that all power is off by opening the line (wall) disconnect switch and by unplugging the power cord to the unit when connections are made inside of the power source.

The PowerCut-1250 / 1500 consoles are equipped with approximately 10-ft. of 4-conductor input power cable for 3-phase connection. If single-phase connection is desired, tape back the red (lt. blue) wire on the input power cable. Connect the single-phase input to the white and black wires only. When operating this machine from a single-phase source, it must be connected to a dedicated 100 Amp feed. Due to the higher input current requirements, the duty cycle of the machine is lower than in three-phase operation.

Connect your air supply to the inlet connection of the filter-regulator.

NUMBER	PIN	CONNECTION
8	H	Voltage Divider (-)
3	C	Voltage Divider (+)
9	I	Arc On signal from PS to CNC, Relay Closing
7	G	
14	N	Start signal from CNC to PS, Relay Closing
13	M	

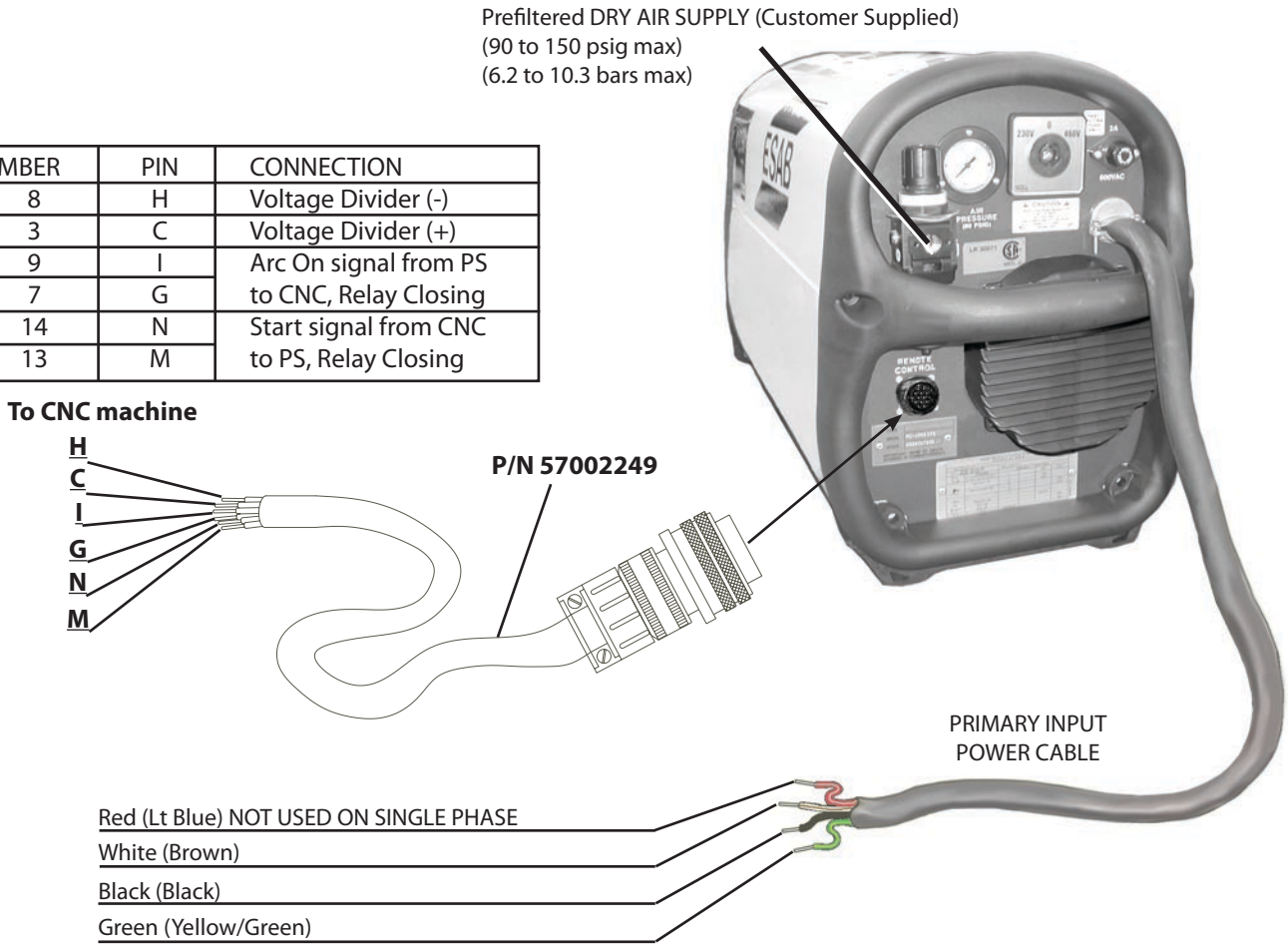


Figure 2-1. Input Connections

WARNING

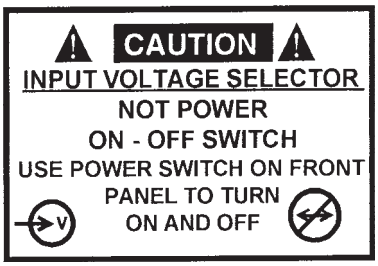
ELECTRIC SHOCK CAN KILL! Before making electrical input connections to the power source, "Machinery Lockout Procedures" should be employed. If the connections are to be made from a line disconnect switch, place the switch in the off position and padlock it to prevent inadvertent tripping . If the connection is made from a fusebox, remove the corresponding fuses and padlock the box cover. If it is not possible to use padlocks, attach a red tag to the line disconnect switch (or fuse box) warning others that the circuit is being worked on.

WARNING

The chassis must be connected to an approved electrical ground. Failure to do so may result in electrical shock, severe burns or death.

WARNING

Before making any connections to the power source output terminals, make sure that all primary input power to the power source is deenergized (off) at the main disconnect switch and that the input power cable is unplugged.



Before connecting to input power, make sure there is a line (wall) disconnect switch with fuses or circuit breakers at the main power panel. You may either use the factory-installed input power cable (4/c, type SO (90 °C), 10 ft (3.1 m) length) or provide your own input power leads. If you choose to provide your own, make sure they are insulated copper conductors. You must have two (single-phase) or three (three-phase) power leads and one ground wire. The wires may be heavy rubber covered cable or may be run in a solid or flexible conduit. Refer to Table 2-3 and 2-4 for recommended input conductors and line fuse sizes.

Table 2-3. (PC-1250) Recommended Sizes For Input Conductors and Line Fuses

Input Requirements			Input & Gnd	Fuse
Volts	Phase	Amps	Conductor	Size
			CU/AWG	Amps
208	1	67A	6	100
208	3	33A/Ph.	6	50
230	1	61A	6	100
230	3	29A/Ph.	6	50
460	3	20	6	50
400	3	18	6mm^2	50
575	3	15	10	25

Table 2-4. (PC-1500) Recommended Sizes For Input Conductors and Line Fuses

Input Requirements			Input & Gnd	Fuse
Volts	Phase	Amps	Conductor	Size
			CU/AWG	Amps
208	1	82A	6	100
208	3	44A/Ph.	6	80
230	1	74A	6	100
230	3	40A/Ph.	6	80
460	3	27	6	50
400	3	24	6mm	50
575	3	18	10	50

NOTE !!!

400V CE Mains Supply Requirements:

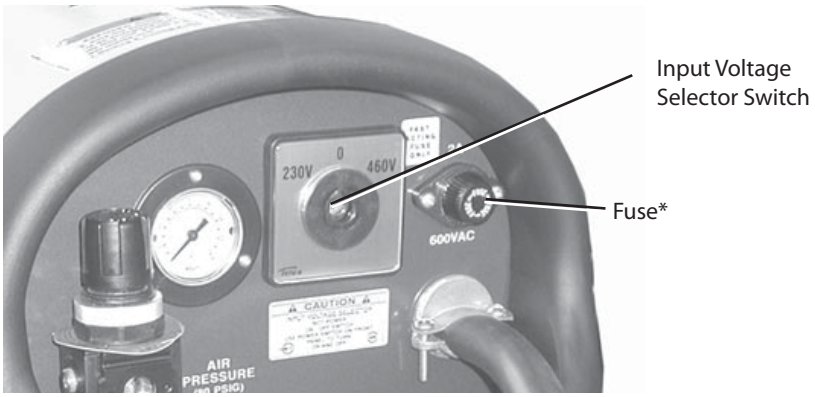
High power equipment may, due to the primary current drawn from the mains supply, influence the power quality of the grid. Therefore connection restrictions or requirements regarding the maximum permissible mains impedance or the required minimum supply capacity at the interface point to the public grid may apply for some types of equipment (see technical data). In this case it is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment may be connected.

2.5.1 INPUT VOLTAGE CHANGEOVER - DUAL-VOLTAGE UNITS ONLY

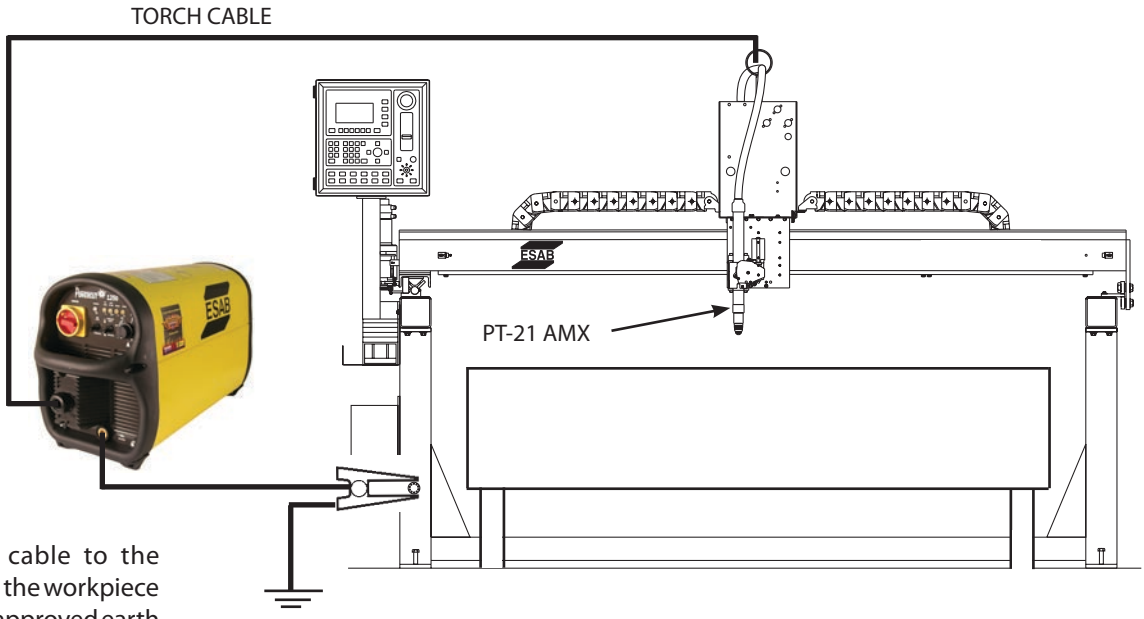
208 - 230 or 460 Mode
To simplify the use of the ESAB Powercut-1250 / 1500 with different input voltages, it has been equipped with a convenient 230/460 selector switch located on the back panel of the unit. Switching between 230 and 460 voltages can be done by using a flathead screwdriver to turn the selector screw.

The Powercut is also equipped with protective fuse that will prevent damage to the power source in the event that the input voltage switch is not set correctly and the unit is powered on.

A line (wall) disconnect switch with fuses or circuit breakers should be provided at the main power panel (see Table 2-1 / 2-2 for fuse sizes). The input power cable of the console may be connected directly to the disconnect switch or you may purchase a proper plug and receptacle from a local electrical supplier. If using plug/receptacle combination, see Table 2-1 / 2-2 for recommended input conductors for connecting receptacle to line disconnect switch.



2.6 SECONDARY OUTPUT CONNECTIONS FOR MECHANIZED CUTTING



Clamp the work cable to the workpiece. Be sure the workpiece is connected to an approved earth ground with a properly sized ground cable.

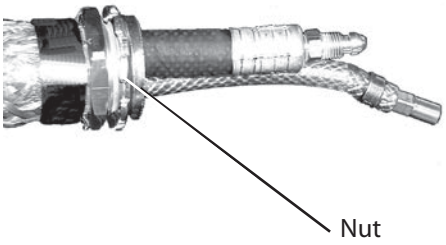
Figure 2-4. PowerCut Interconnection Diagram

2.6.1 MECHANIZED TORCH INSTALLATION

Use the following procedures to install the PT-21AMX torch.

A. Remove torch connection cover from front panel. Cover is held in place by two screws. If strain relief connector is present, remove before connecting the PT-21AMX torch.

B. Remove nut on torch cable assembly.



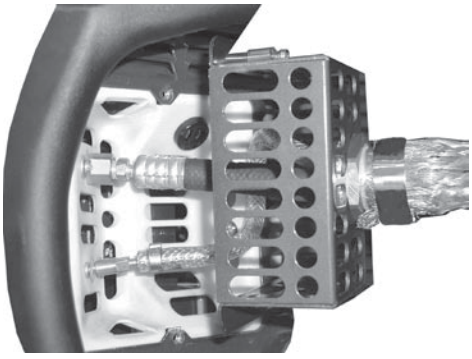
C. Insert torch cable assembly through opening in cover.

D. Re-attach cable nut and tighten.

E. Pull an adequate amount of hose through the cover to allow ease of hose connections.

F. Attach hoses and tighten.

G. Slide cover back into place and tighten screws.



3.0 OPERATION

3.1 PowerCut-1250 / 1500 CONTROLS

NOTE: See Section 3.1.C, for complete operation instructions

NOTE: Trigger Lock Switch.

Mechanized Operation using the PT-21AMX torch - In mechanized operation the Trigger Lock function disabled. Instead, the switch functions as an "Auto-Restrike" selector. To turn Auto-Restrike "on" (grate cutting), place the switch in the up position. To turn Auto-Restrike "off", place the switch in the down position.

Trigger Lock Switch

TRIGGER LOCK Auto-Restrike "on" (Grate cutting)

UNLOCK Auto-Restrike "off" (Standard cutting)

3.2 PT-21AMX TORCH USED WITH MECHANIZED PLASMA ONLY

WARNING

Make sure power switch on the POWERCUT is in the OFF position before working on the torch.

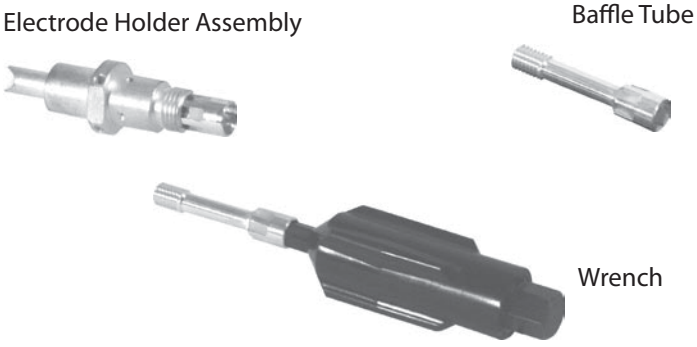
WARNING

The PT-21 AMX torch head contains a gas flow check valve that acts in conjunction with the flow switch and circuitry within the power source. This system prevents the torch from being energized with high voltage if the torch switch is accidentally closed when the shield is removed. Always replace torch with the

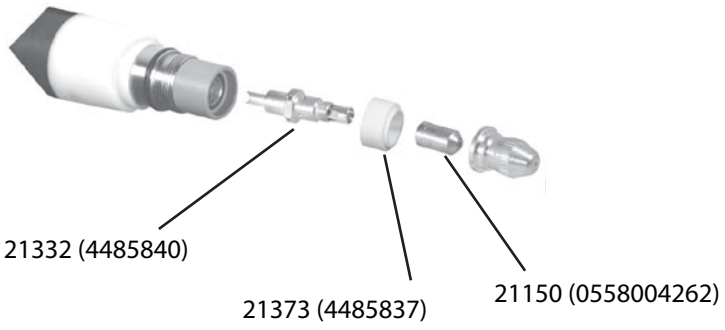
1. The seat comes assembled to the front end of the torch. If the seat becomes damaged, the torch body must be replaced. DO NOT attempt to remove the seat from torch body.

(NOTE: Part numbers in parenthesis apply to "CE"/European units only.)

2. Electrode holder assembly p/n 21332 (4485840) includes the baffle tube p/n 21374 (4485838). If baffle tube becomes damaged, it can be replaced by unthreading the damaged tube out of the holder. Use small hex end of the wrench p/n 21375 (4485842) in hex broach on the tube. Tighten tube securely but do not over-tighten.



3. Install the electrode insulator p/n 21373 (4485837) onto electrode holder assembly p/n 21332 (4485840) and then thread electrode p/n 21150 (0558004262) onto the electrode holder assembly. Assemble electrode firmly by hand. Do not use wrenches or pliers. These three parts combined are the electrode assembly.



4. Install nozzle onto the electrode assembly by inserting small shoulder on electrode insulator into nozzle's rear opening. Place nozzle and electrode assembly into the heat shield. If front end of the torch is facing down as normal in a setup, the nozzle and electrode assembly can be stacked in the heat shield and then assembled to the torch. Be sure to use proper heat shield and nozzle combination.

(NOTE: Part numbers in parenthesis apply to "CE"/European units only.)

5. Apply a thin film of lubricant p/n 17672 (0558000443) to O-ring p/n 488157 (4485841).

Lubricant

6. Tighten heat shield fully to hold the parts in firm contact with each other and to the torch head. "Fully" means at least 3/16" (4.8mm) rotation after electrode seat contacts electrode holder.

To connect PT-21AMX torch to the console, connect the power cable of the torch to the "NEG" terminal and pilot arc cable to the "POS" terminal of the unit using pilot arc adaptor (p/n 19497 (4485843) - supplied with spare parts kit). A separate remote control switch cable is required for connecting to the switch receptacle on the console.

The front end of the torch contains a gas flow check valve that acts in conjunction with the circuitry provided in the power supply. This patented system provides a safety interlock preventing the torch from being accidentally energized with high voltage when the heat shield is removed and the torch switch is accidentally closed.

3.3 PT-21AMX POSSIBLE CUTTING ISSUES

CAUTION

REPLACE ELECTRODE BEFORE PITTING BECOMES DEEPER THAN .06 INCH (1.5 MM)

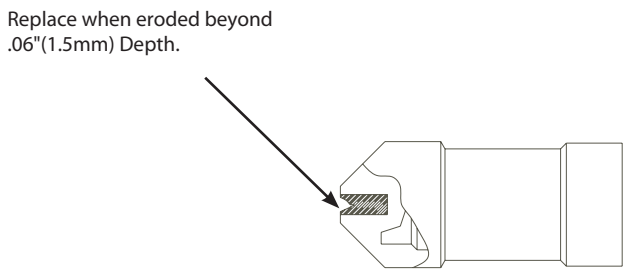


Figure 3-1. Electrode Wear Limit

NOTE: When replacing the nozzle, always inspect the electrode for wear. If more than .06" (1.5mm) of electrode has eroded, replace the electrode. If the electrode is used beyond this recommended wear limit, damage to the torch and power source may occur. Nozzle life is also greatly reduced when using the electrode below the recommended limit.

POWERCUT-1250 / 1500

MAINTENANCE
TROUBLESHOOTING
SCHEMATIC DIAGRAMS
REPLACEMENT PARTS

4.0 GENERAL

If this equipment does not operate properly, stop work immediately and investigate the cause of the malfunction. Maintenance work must be performed by an experienced person, and electrical work by a trained electrician. Do not permit untrained persons to inspect, clean, or repair this equipment. Use only recommended replacement parts.

Be sure that the wall disconnect switch or wall circuit breaker is open before attempting any inspection or work inside of the Powercut.

4.1 INSPECTION AND CLEANING

Frequent inspection and cleaning of the PowerCut is recommended for safety and proper operation. Some suggestions for inspecting and cleaning are as follows:

A. Check work cable for secured connection to workpiece.
B. Check safety earth ground at workpiece and at power source chassis.
C. Check heat shield on torch. It should be replaced if damaged.
D. Check the torch electrode and cutting nozzle for wear on a daily basis. Remove spatter or replace if necessary.
E. Make sure cable and hoses are not damaged or kinked.
F. Make sure all plugs, fittings, and ground connections are tight.
G. With all input power disconnected, and wearing proper eye and face protection, blow out the inside of the Powercut using low-pressure dry compressed air.

Water or oil occasionally accumulates in compressed air lines. Be sure to direct the first blast of air away from the equipment to avoid damage to the Powercut.

H. Occasionally, bleed all water from the filter beneath the air filter-regulator.

4.2 COMMON CUTTING PROBLEMS

Listed below are common cutting problems followed by the probable cause of each. If problems are determined to be caused by the PowerCut, refer to the maintenance section of this manual. If the problem is not corrected after referring to the maintenance section, contact your ESAB distributor.

A. Insufficient Penetration.
1. Current too low.
2. Cutting speed too fast.
3. Damaged cutting nozzle.
4. Improper air pressure.
5. Low air flow rate.

B. Main Arc Extinguishes.
1. Cutting speed too slow.
2. Worn electrode.

C. Dross Formation. (In some materials and thicknesses, it may be impossible to get dross-free cuts.)
1. Current too low.
2. Cutting speed too fast or too slow.
3. Improper air pressure.
4. Faulty nozzle or electrode.
5. Low air flow rate.

D. Double Arcing. (Damaged Nozzle Orifice.)
1. Low air pressure.
2. Damaged cutting nozzle.
3. Loose cutting nozzle.
4. Heavy spatter accumulation on nozzle.

E. Uneven Arc.
1. Damaged cutting nozzle or worn electrode.

F. Unstable Cutting Conditions.
1. Incorrect cutting speed.
2. Loose cable or hose connections.
3. Electrode and/or cutting nozzle in poor condition.

G. Main Arc Does Not Strike.
1. Worn electrode.
2. Loose connections.
3. Work cable not attached.

H. Poor Consumable Life.
1. Improper gas pressure.
2. Contaminated air supply.
3. Low air flow rate.

4.3 IGBT KIT PC-1250/1500 HANDLING AND REPLACEMENT

P/N 0558008966

PART NUMBER	QTY	DESCRIPTION
0558006151	2	IGBT DUAL 150A 600V
38224	1	PCB IGBT DRIVER
05S12020	4	SCREW SKT HEX M5 X 20 BLK
05W01055	4	WASHER FLAT M5
64302920	4	WASHER LOCK #10
0558003084	1	COMPOUND HEATSINK AOS - WHITE

IGBT Handling

Since IGBT gates are insulated from any other conducting region, care should be taken to prevent static build up, which could possibly damage gate oxides. All IGBT modules are shipped from the factory with conductive foam contacting the gate and emitter sense pins. Always ground parts touching gate pins during installation. In general, standard ESD precautions should be followed.

Other handling precautions that should also be observed are as follows:

- Use grounded work station with grounded floors and grounded wrist straps when handling devices.
- Use a 100Ω resistor in series with the gate when performing curve tracer tests.
- Never install devices into systems with power connected to the system.

Module Replacement

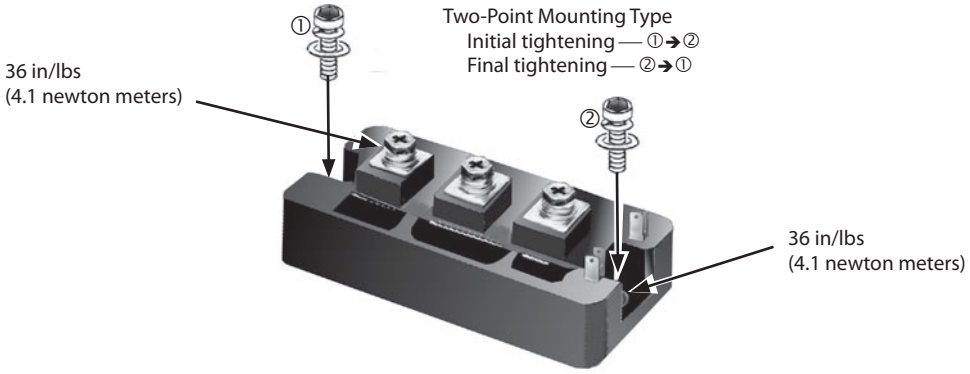
When mounting modules on a heatsink, certain precautions should be taken to prevent any damage against a sudden torque. If a sudden torque ("one-sided tightening") is applied at only one mounting terminal the ceramic insulation plate or silicon chip inside the module may get damaged.

The mounting screws are to be fastened in the order shown. Also, care must be taken to achieve maximum contact (i.e. minimum contact thermal resistance) for the best heat dissipation.

A torque wrench should be used. Tighten mounting and terminal screws per Torque Requirements shown in illustration below. If device is over-torqued, the device can be damaged like the above "one-sided tightening".

Application of a Thermal Compound or Thermal Pad on the contact surface is required to properly remove heat from the device. It is recommended that a unit manufactured with a thermal pad use thermal compound for replacement. Thermal compound may always be used as a replacement for a pad. Never use both compound and a pad.

Thoroughly remove any residual material from the mating surfaces. Use supplied Heat Sink Compound or equivalent. Apply a thin layer (.005" nominal) between mating surfaces.



Screw Fastening Order and Torque

5.0 TROUBLESHOOTING

WARNING

ELECTRIC SHOCK CAN KILL! Be sure that all primary power to the machine has been externally disconnected. Open the line (wall) disconnect switch or circuit breaker before attempting inspection or work inside of the power source.

Check the problem against the symptoms in the following troubleshooting guide. The remedy may be quite simple. If the cause cannot be quickly located, shut off the input power, open up the unit, and perform a simple visual inspection of all the components and wiring. Check for secure terminal connections, loose or burned wiring or components, bulged or leaking capacitors, or any other sign of damage or discoloration.

The cause of control malfunctions can be found by referring to the sequence of operations and electrical schematic diagram and checking the various components. A volt-ohmmeter will be necessary for some of these checks.

WARNING

Voltages in plasma cutting equipment are high enough to cause serious injury or possibly death. Be particularly careful around equipment when the covers are removed.

NOTE: Before checking voltages in the circuit, disconnect the power from the high frequency PC Board (PCB-2, Connector J2) to avoid damaging your voltmeter.

5.1 TROUBLESHOOTING GUIDE

A. Power Light does not come on.

1. Visually inspect the machine for any damage.

2. Check following:

   a. Check if the machine power cord is plugged into the input power receptacle.

   b. Measure the input power at the receptacle. If not present, then check the wall disconnect switch and it's fuses.
   c. Check Fuse (F1).

3. If above items check OK , the problem is internal. Send unit to an Authorized Repair Station for repair.

   a. Ensure that ribbon cable is connected to main PCB-1 and front panel PCB-3
   b. Measure voltage between pins P7-5 and P7-6 of the control board. If there is no voltage, then replace Control Transformer (T6).
   c. If the voltage is present, then the pilot light may be burnt out.

B. No Air Flow

1. Check air inlet supply. Unit requires 350 cfh at 80psig (165.1 l/m @ 5.5 bars).

2. Check air hose and connections. Tighten if leaking.

3. Does air flow when "air test" switch is in test position?

   a. If not, check torch consumables, replace if necessary.
   b. If above items check OK , the problem is internal. Take unit to an Authorized Repair Station for repair.

C. The Power light is on, but nothing happens when the torch switch is depressed. Fault light does not activate.

NOTE: Unplug high frequency connection before attempting to work on this problem.

1. With the machine power on, depress the torch switch. On the control board the LED 1 should be lit as long as the switch is depressed. If not then check:

   a. Turn power off to the machine. Unplug Control board. Put an ohmmeter across J3-3 and J3-4 to take resistance reading. Depress torch switch. Meter should read a short. If not, then one of the following is not working properly:
   b. Torch switch or the leads. Unplug the torch switch leads at the machine. Put a meter across the two plug pins. Meter should read a short when the torch switch is depressed. If not, then either there are broken switch leads or a malfunctioning switch.

2. Check transformer secondary voltages at the output diode modules. Refer to system schematic. Replace the transformer module if the correct secondary voltages are not present.
3. If everything above checks out all right, then the PCB1 Control Board should be replaced.

D. Fault light activates when torch switch is closed.

The machine monitors conditions necessary for the safe operation of the Powercut. The fault lights will glow under the following conditions and operations will come to a stop.

1. **High/Low line voltage**. The "AC LINE" light will blink to indicate that the input voltage is outside the +/- 15% range of the nominal voltage.

2. **Gas Flow indicator** - The fault light will blink to indicate that the air flow is low or that the torch is not providing any back pressure.

    a. Check the air pressure at the machine regulator. It should be adjusted to 80 psig (5.5 bars). If no air pressure, check the air at the supply point. Also, check for any obstructions in the air hose.
    b. Air flow may be blocked at the torch tip. Check the torch consumables (see Figure 3.4). Also check for any obstructions in the torch leads.

    NOTE: If above items check OK , the problem is internal. Send unit to an Authorized Repair Station for repair.

    c. Put the 'Air Check' switch to On position. Air should flow through torch. If not, and air pressure is set at required 80 psig (5.5 bars), check gas Solenoid (SOL1) for proper operation.
    d. Air Check switch may also be malfunctioning if the air is flowing continuously or putting in the On position does not turn air on.

3. **Over Temperature indicator .** The fault light will blink to indicate that the machine has overheated. This generally indicates that the air flow has been blocked. Clear blockage and allow the power source to cool before operating.

    a. Thermal Switch (TS1) may be open. It will open if the heat sink temperature reaches 80°C. With the machine power off, check the continuity between P6-7 and P6-8 of the control board. If the switch is OK, then the ohmmeter should read a direct short. If not, then it should read open.
    b. If the switch is malfunctioning, replace it. Clean the surface of the heat sink before installing the switch.

4. **Fault Indicator**. When this light blinks, either the system failed to initiate a pilot arc after a number of attempts, or there has been an over-current event within the system.

    a. If the light blinks for 10 seconds and then stops, then the problem is pilot arc initiation. Check the consumables in the torch.
    b. If the light continues to blink, and the system does not reset, then the fault is an over-current event. One likely source of an over-current fault is a nozzle to electrode short. Turn off the machine and inspect the torch and its consumables. Replace the consumables as needed. Turn the machine back on. If the problem occurs again, the machine may require service.

c. To check if the output is shorted, measure the resistance by putting the ohmmeter leads across the output. Put the black lead to the "work" terminal and the red lead to the torch electrode terminal. The reading should be about 2K OHMs.
b. If the resistance reading is different than above, check the torch, the output bridge and Start-up Board (PCB-6).

E. Air is On but nothing happens when torch switch is operated.

1. Check the torch. Make sure that the valve pin is installed and the heat shield is very tight.

2. Check to assure high frequency is present at the torch. **Disconnect HI FREQUENCY leads**. Check for 575 volt supply to the high frequency unit between P2A-1 & P2A-3 of the High Frequency Board (PCB2) with torch switch closed.

3. With HI FREQUENCY leads disconnected, measure open circuit voltage. It should be 320 VDC between "Work" and "Torch" terminals. If it is not present then any one of the following may not be working properly:

   a. Check the operation of the Thermal Switch (TS1). See D.3.a. above.
   b. Check Air Check switch operation. It might be stuck in On position. Pilot arc will not initiate if this switch is in the ON position. (safety reasons)
   c. Check air flow switch. There may be internal short. See D.2.c above.
   d. Measure voltage across C5 or C6 capacitor. It should be as follows:

      approx. 325 VDC with 230 V supplied to the 230/460 volt unit.
      approx. 294 VDC with 208 V supplied to the 230/460 volt unit.
      approx. 325 VDC with 460 V supplied to the 230/460 volt unit.
      approx. 282 VDC with 400 V supplied to the 400 volt unit.
      approx. 400 VDC with 575 V supplied to the 575 volt unit.

      If not, one of following could be malfunctioning:

      1). Check the capacitors C5 and C6 for any damage.

      2.) Check input bridge/SCR Module (BR1) This can be checked without taking it out of the circuit using an volt/ohmeter. Replace it if found malfunctioning. Follow bridge installation instructions.

      3.) Check Inrush current resistor (R1), located on the Input Bridge Heatsink and SCR (Q1). Replace if malfunctioning.

   e. IGBTs may be damaged. See IGBT installation procedure. Before replacing IGBTs, make sure to check the zener diodes and pico fuses on the IGBT driver boards.

F. High Frequency and Pilot Arc are on but Main Arc does not transfer.

1. Make sure work clamp is connected to work material.

2. Check the torch. Replace consumables if necessary.

G. Poor Cutting Performance.

1. Check air supply regulator . It should be adjusted to 80 psig (5.5 bars).

2. The air supplied to the torch should be free of oil and water.

3. Make sure the consumables in the torch are acceptable.

4. Check open circuit voltage. See E.3 above.

5. Check the output. Use a calibrated current probe capable of measuring 100 amps in the presence of high frequency.

H. Air does not shut off.

1. Check air test, the gas solenoid valve is energized when the switch is in the "on" position.

2. Does air flow stop when the torch switch is unplugged? If yes, check and repair the torch. If not, send unit to an Authorized Repair Station for repair.

    a. Check voltage to solenoid coil, if present when torch switch is unplugged, replace PCB1. If voltage is "0", replace solenoid valve.

I. Main arc is difficult to start.

1. The most common reason is worn or missing consumables. Check and replace if necessary.
2. Input air must be clean and dry.
3. Input air pressure must be at least 85 psig (5.7 bars).
4. Torch connections must be tight.
5. Work cable and clamp must be in good condition and must make a good electrical connection to the material to be cut.
6. If above items check OK , the problem is internal. Send unit to an Authorized Repair Station for repair.

    a. Missing or weak pilot arc. Check pilot arc fuse, open circuit voltage and pilot arc wiring.
    b. Inoperative Start-up Board (PCB-6).

5.2 REFERENCE VOLTAGE CHECKS

A. Control Board Assembly (PCB1)

1. **LED's**

LED- (D9) - Torch Switch
LED- (D4) - Pilot Arc Relay
LED- (D1) - Gas Solenoid Valve

2. **Voltage Test Points**

Tests are made with power on - no arc.

Disable High Frequency by disconnecting blue wire with black sleeve

TP-1 - Torch trigger signal
TP-4 - IGBT's driving signal - switching frequency = 18.5 KHz
TP-5 - IGBT's driving signal - switching frequency = 18.5 KHz
TP-7 - +5 vdc
TP-8 - +15 vdc
TP-9 - -15 vdc
TP-10 - Ground

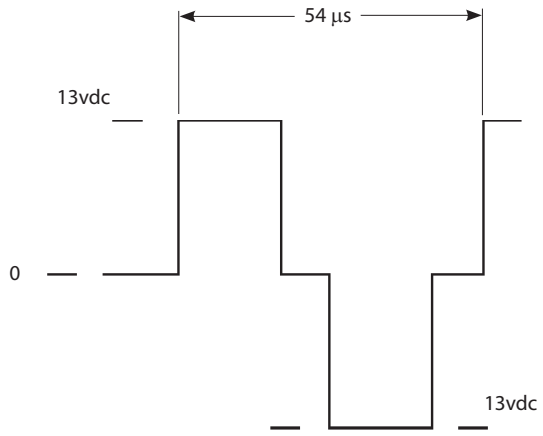
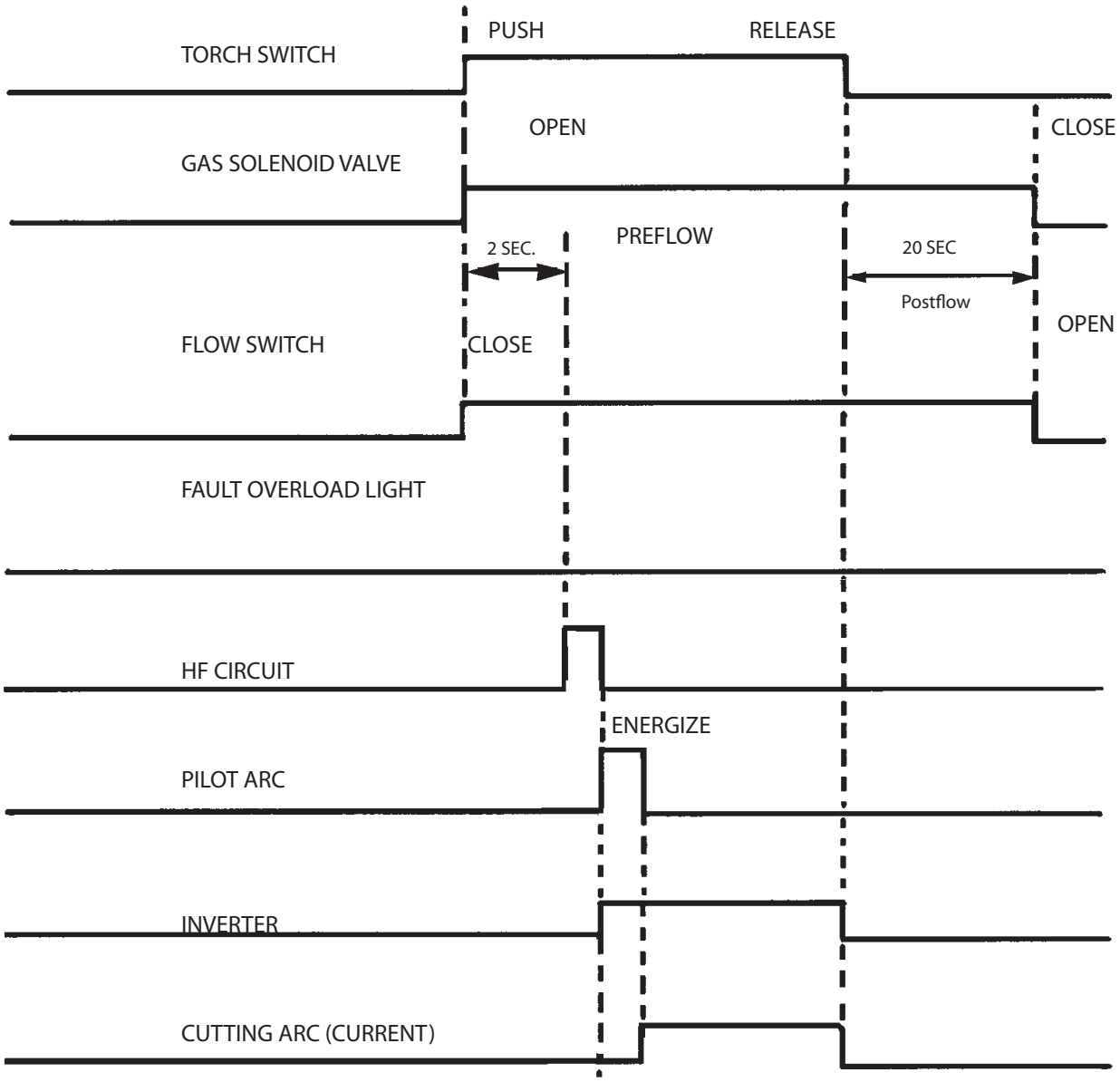


Figure 5.1 IGBT Gating Signal

5.3 SEQUENCE OF OPERATION

A. TRIGGER LOCK "UNLOCK" position (Applies to PT-21AMX and PT-32EH Torches)

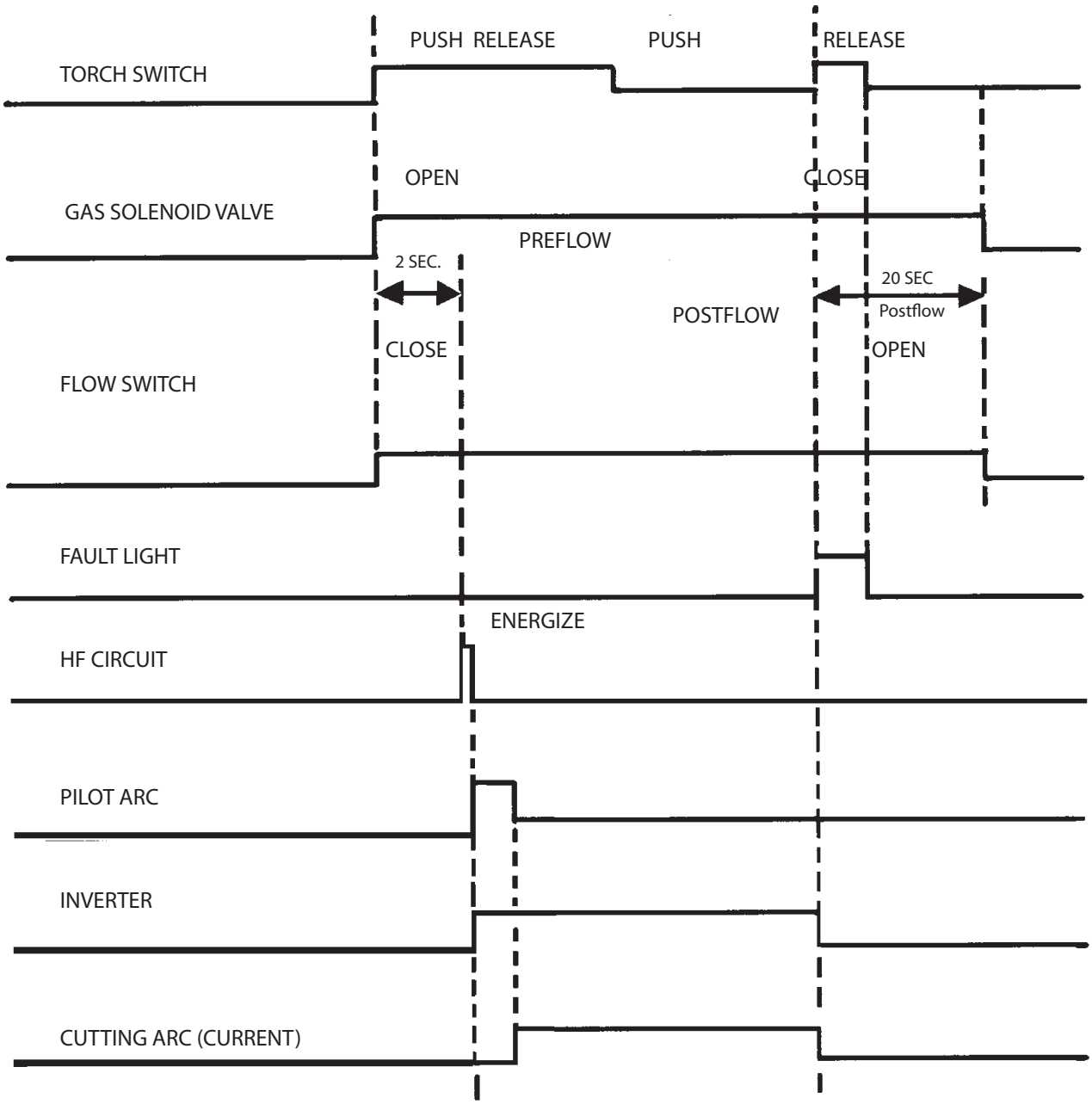


NOTES:

1. When the torch switch is pushed during postflow period, the postflow and preflow times are canceled, and the HF is energized immediately.

2. When the red fault light comes on, cutting operation should be stopped. The postflow time starts from the moment the torch switch is released.

B. TRIGGER LOCK "LOCK" position (Manual Cutting Only with PT-32EH Torch)



NOTES:

1. When the torch switch is pushed during postflow period, the postflow time is reset, the preflow time is canceled, and the HF is energized immediately.

2. When the red fault light comes on, cutting operation should be stopped. The postflow time starts from the moment the torch switch is released.

3. FAULT light is on during second "turn-off" trigger only. This does not affect performance in any way.

NOTE:
Schematics on 279.4mm x 431.8mm
(11″ x 17″) paper are included
inside the back cover of this manual.

6.0 Replacement Parts

6.1 General

Always provide the serial number of the unit on which the parts will be used. The serial number is stamped on the unit nameplate.

6.2 Ordering

To ensure proper operation, it is recommended that only genuine ESAB parts and products be used with this equipment. The use of non-ESAB parts may void your warranty.

Replacement parts may be ordered from your ESAB Distributor.

Be sure to indicate any special shipping instructions when ordering replacement parts.

Refer to the Communications Guide located on the back page of this manual for a list of customer service phone numbers.

Note

Bill of material items that have blank part numbers are provided for customer information only.
Hardware items should be available through local sources.

6.3 IGBT KIT PC-1250/1500 REPLACEMENT

P/N 0558008966

PART NUMBER	QTY	DESCRIPTION
0558006151	2	IGBT DUAL 150A 600V
38224	1	PCB IGBT DRIVER
05S12020	4	SCREW SKT HEX M5 X 20 BLK
05W01055	4	WASHER FLAT M5
64302920	4	WASHER LOCK #10
0558003084	1	COMPOUND HEATSINK AOS - WHITE

NOTES

REVISION HISTORY

1. Original release of this manual is 05/2003.

2. Revision 11/2003: changed panel views to show updated voltage switch.

3. Revision 04/2004: Updated schematic diagram on page 66 per change notice 043018.

4. Revision 05/2004: In the Replacement Parts Section - changed bom item # 42 from: 38131 to: 0558038276. See DNECO # 043086.

5. Revision 10/2004: Updated schematics on Pages 65 and 67 per change notice 043236.

6. Revision 12/2004: Schematics moved to 11 x 17 pages in back of manual.

7. Revision 01/2005: Changed main transformer module from 0558003377 to 0558005313. (CN# 053002)

8. Revision 06/2005: added Air Line Filter Regulator p/n 0558005394 note in Replacement Parts section per CN #053013.

9. Revision 08/2005: In replacement parts section, updated finger guard from: p/n 0558002994 to: p/n 0558005659 & cover torch connection from: p/n 0558002464M to: 0558005658 per CN-053103.

10. Revision 12/2005: Updated front & rear views. In replacement parts section p/n table #2, item 32, chgd p/n from: 951800 to: 0558005462. Removed Air Line Filter Regulator p/n 0558005394 **NOTE** in Replacement Parts section.

11. Revision 01/2006: Changed p/n 0558003075 to p/n 0558001379 per DNECO #053179.

12. Revision 03/2006: Added 0555001935F to the "Console" list in Subsection 1.2.1.
    Added 0558005902 and 0558005903 to the "Ordering Information" list in Subsection 1.2.2
    Added 0558003517 and 0558005900 to the "Console" list in Subsection 1.2.2
    Added 0558005331 and 0558005900 to the BOM charts in Section 6, Replacement Parts
    Refer to ECN #063042 and PA #6900-05-24

13. Revision 05/2006: Updated P/Ns in Replacement Parts Tables per ECN #063080.

14. Revision 12/2006: Changed Torch Holder Assy p/n from: 16V83 (0558004250) to: 0558005926 and updated picture.

15. Revision 12/2007: Added 400V harmonics info to PC-1500 pages. Updated replacement parts section.

16. Revision 03/2008: Updated replacement parts section per ECN #083042.

17. Revision 04/2009: Updated replacement parts section per ECN #093066 and updated IGBT info.

ESAB Welding & Cutting Products, Florence, SC Welding Equipment
COMMUNICATION GUIDE - CUSTOMER SERVICES

A. CUSTOMER SERVICE QUESTIONS:
Telephone: (800)362-7080 / Fax: (800) 634-7548 Hours: 8:00 AM to 7:00 PM EST
Order Entry Product Availability Pricing Order Information Returns

B. ENGINEERING SERVICE:
Telephone: (843) 664-4416 / Fax : (800) 446-5693 Hours: 7:30 AM to 5:00 PM EST
Warranty Returns Authorized Repair Stations Welding Equipment Troubleshooting

C. TECHNICAL SERVICE:
Telephone: (800) ESAB-123/ Fax: (843) 664-4452 Hours: 8:00 AM to 5:00 PM EST
Part Numbers Technical Applications Specifications Equipment Recommendations

D. LITERATURE REQUESTS:
Telephone: (843) 664-5562 / Fax: (843) 664-5548 Hours: 7:30 AM to 4:00 PM EST

E. WELDING EQUIPMENT REPAIRS:
Telephone: (843) 664-4487 / Fax: (843) 664-5557 Hours: 7:30 AM to 3:30 PM EST
Repair Estimates Repair Status

F. WELDING EQUIPMENT TRAINING
Telephone: (843)664-4428 / Fax: (843) 679-5864 Hours: 7:30 AM to 4:00 PM EST
Training School Information and Registrations

G. WELDING PROCESS ASSISTANCE:
Telephone: (800) ESAB-123 Hours: 7:30 AM to 4:00 PM EST

H. TECHNICAL ASST. CONSUMABLES:
Telephone : (800) 933-7070 Hours: 7:30 AM to 5:00 PM EST

IF YOU DO NOT KNOW WHOM TO CALL

Telephone: (800) ESAB-123
Fax: (843) 664-4462
Hours: 7:30 AM to 5:00 PM EST
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